

Course Syllabus

1	Course title	INDUSTRIAL CHEMISTRY 2	
2	Course number	0303451	
3	Credit hours	3	
	Contact hours (theory, practical)	3+0	
4	Prerequisites/corequisites	Industrial Chemistry I (0303351)	
5	Program title	Chemistry	
6	Program code	03	
7	Awarding institution	The University of Jordan	
8	School	Science	
9	Department	Chemistry	
10	Course level	4 th year	
11	Year of study and semester (s)	2 nd semester 2024-2025	
12	Other department (s) involved in teaching the course	none	
13	Main teaching language	English	
14	Delivery method	<input checked="" type="checkbox"/> Face to face learning <input type="checkbox"/> Blended <input type="checkbox"/> Fully online	
15	Online platforms(s)	<input type="checkbox"/> Moodle <input checked="" type="checkbox"/> Microsoft Teams <input type="checkbox"/> Skype <input type="checkbox"/> Zoom <input type="checkbox"/> Others.....	
16	Issuing/Revision Date		

17 Course Coordinator:

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19 Course Description:

This course covers the basic consideration, characteristics of the chemical industry, such as production processes for Cement, Glass, Chlor-Alkali chemical industries, Nitrogen industries, industrial Metallurgy and process of extraction for iron, copper and aluminum.



20 Course aims and outcomes:

A- Aims: Course Learning Outcomes (0303351) Industrial Chemistry -1

Upon successful completion of this course, students will be able to:

- CLO-1. Problem-Solving: Graduates will be able to apply mathematical and scientific knowledge to calculate the reactor's volume, the reaction's ordering, the separation techniques, and the reaction time. (ASO-1)
- CLO-2. Identify, formulate, and solve technical or scientific problems relevant to Industrial Chemistry-2. (ASO-1 & ASO-2)
- CLO-3. Communication: Graduates will be able to communicate scientific information effectively and accurately to a range of audiences, including both technical and non-technical audiences. (ASO-1 & ASO-5)

B- Students Learning Outcomes (SLOs):

- SO-1. Problem Solving: Graduates will be able to apply mathematical and scientific knowledge to identify, formulate, and solve technical or scientific problems relevant to the discipline of chemistry.
- SO-2. Design: Graduates will be able to use their understanding of chemistry concepts and principles to formulate and design systems, processes, procedures, or programs to meet desired goals and outcomes.
- SO-3. Experimental Skills: Graduates will be able to design, conduct, and analyze experiments or test hypotheses, utilizing appropriate chemical techniques and scientific judgment to draw meaningful conclusions.
- SO-4. Communication: Graduates will be able to communicate scientific information effectively and accurately to a range of audiences, including both technical and non-technical audiences.
- SO-5. Ethics and Global Context: Graduates will understand and apply ethical and professional responsibilities in the context of the impact of technical and scientific solutions on global, economic, environmental, and societal issues.
- SO-6. Teamwork: Graduates will be able to work effectively as part of a team, establishing goals, planning tasks, meeting deadlines, and analyzing risk and uncertainty in the context of chemistry-related projects and initiatives.
- SO-7. Handling Chemicals: An ability to apply the proper procedures for safe handling of chemicals.



SLOs SLOs of the course	SLO (1)	SLO (2)	SLO (3)	SLO (4)	SLO (5)
CLO-1	✓				
CLO-2	✓	✓			
CLO-3	✓				✓

21. Topic Outline and Schedule:

Week	Lecture	Topic	Student Learning Outcome	Learning Methods (Face to Face/Blended / Fully Online)	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Resources
1	1.1	Introduction to cement Industry	CLO1 CLO 2	Face to Face	Classroom		1 st exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991
	1.2	Raw materials of cement industry	CLO1 CLO 2	Face to Face	Classroom		1 st exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991
	1.3	Classification of cement	CLO1 CLO 2 CLO3	Face to Face	Classroom		1 st exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991

2	2.1	processes of Cement	CLO1 CLO 2	Face to Face	Classroom		1 st exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	2.2	Manufacturing processes of Cement and Lime	CLO1 CLO 2	Face to Face	Classroom		1 st exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	2.3	Setting and Hardening process	CLO1 CLO 2	Face to Face	Classroom		1 st exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
3	3.1	Introduction to Glass Industry	CLO1 CLO 2 CLO3	Face to Face	Classroom		1 st exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	3.2	Physical and chemical properties	CLO1 CLO 2	Face to Face	Classroom		1 st exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	3.3	Characteristic of glass	CLO1 CLO 2	Face to Face	Classroom		1 st exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
4	4.1	Raw material Manufacturing process of glass	CLO1 CLO 2 CLO3	Face to Face	Classroom		1 st exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	4.2	Ceramic- Raw material.	CLO1 CLO 2 CLO3	Face to Face	Classroom		1 st exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	4.3	Manufacturing process of White ware, Glazing.	CLO1 CLO 2	Face to Face	Classroom		1 st exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
5	5.1	Introduction to Chlor-alkali products	CLO1 CLO 2	Face to Face	Classroom		1 st exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	5.2	Uses of chlorine	CLO1 CLO 2	Face to Face	Classroom		1 st exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	

	5.3	Uses of caustic soda (sodium hydroxide)	CLO1 CLO 2	Face to Face	Classroom		2 nd Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
6	6.1	Uses of hydrogen	CLO1 CLO 2	Face to Face	Classroom		2 nd Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	6.2	Types of cell Mercury cell process	CLO1 CLO 2	Face to Face	Classroom		2 nd Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	6.3	Diaphragm cell process Membrane cell process.	CLO1 CLO 2	Face to Face	Classroom		2 nd Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
7	7.1	Introduction to Phosphorus industries:	CLO1 CLO 2	Face to Face	Classroom		2 nd Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	7.2	Calcium phosphate,	CLO1 CLO 2	Face to Face	Classroom		2 nd Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	7.3	manufacture of phosphoric acid,	CLO1 CLO 2	Face to Face	Classroom		2 nd Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
8	8.1	single and triple super phosphate,	CLO1 CLO 2	Face to Face	Classroom		2 nd Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	8.2	baking powder and DAP.	CLO2 CLO3	Face to Face	Classroom		2 nd Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	8.3	applications	CLO 2	Face to Face	Classroom		2 nd Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
9	9.1	Introduction to Sulphur Industry	CLO 2	Face to Face	Classroom		2 nd Exam	Introduction of Industrial Chemistry,	

								Blackie, Glasgow, 1991	
	9.2	Mining and manufacture of sulfur	CLO1 CLO 2	Face to Face	Classroom		2 nd Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	9.3	Products of sulfur	CLO1 CLO 2	Face to Face	Classroom		2 nd Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
10	10.1	Sulfuric acid:	CLO1 CLO 2	Face to Face	Classroom		2 nd Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	10.2	Manufacturing routes	CLO1 CLO 2	Face to Face	Classroom		2 nd Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	10.3	Environmental impact	CLO1 CLO 2	Face to Face	Classroom		2 nd Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
11	11.1	Nitrogen Industries:	CLO1 CLO 2	Face to Face	Classroom		2 nd Exam	C. A. Heaton, An Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
11 12	11.2	Manufacturing of Urea	CLO1 CLO 2	Face to Face	Classroom		2 nd Exam	C. A. Heaton, An Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	11.3	Manufacturing of Calcium cyanamide	CLO1 CLO 2	Face to Face	Classroom		Final Exam	C. A. Heaton, An Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	12.1	Manufacturing of Ammonia	CLO 2	Face to Face	Classroom		Final Exam	C. A. Heaton, An Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
12 13	12.2	Type of synthesis	CLO1 CLO 2 CLO3	Face to Face	Classroom		Final Exam	C. A. Heaton, An Introduction of Industrial Chemistry,	

								Blackie, Glasgow, 1991	
	12.3	properties	CLO1 CLO 2	Face to Face	Classroom		Final Exam	C. A. Heaton, An Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	13.1	Nitric acid	CLO1 CLO 2	Face to Face	Classroom		Final Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	13.2	Introduction to metallurgy Industry	CLO1 CLO 2	Face to Face	Classroom		Final Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
13 14	13.3	Extraction processes	CLO1 CLO 2	Face to Face	Classroom		Final Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	14.1	Iron and Steel Industries	CLO 2 CLO3	Face to Face	Classroom		Final Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	14.2	Types and properties of stainless steel	CLO 2 CLO3	Face to Face	Classroom		Final Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
14 15	14.3	Aluminum mining	CLO1 CLO 2 CLO3	Face to Face	Classroom		Final Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	15.1	Ammonium Alloys	CLO 2 CLO3	Face to Face	Classroom		Final Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	15.2	Copper mining	CLO 2 CLO3	Face to Face	Classroom			Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
15	15.3	Copper refining	CLO 2 CLO3		Classroom			Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
					Classroom				



22 Evaluation Methods:

Opportunities to demonstrate achievement of the SLOs are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	SLOs	Period (Week)	Platform
1 st exam	30%	Cement Industry Glass Industry Chlor-alkali products	CLO1 CLO 2 CLO3	7 th week	In the department
2 nd exam	20%	Phosphorus industries. Sulphur and Sulfuric acid. Nitrogen Industries.	CLO1 CLO 2 CLO3	10 th week	In the department
Final	50%	Cement Industry Glass Industry Chlor-alkali products Phosphorus industries. Sulphur and Sulfuric acid. Nitrogen Industries. Metallurgy Industry. Iron, copper, and Aluminum	CLO1 CLO 2 CLO3	17 th week	In the department

23 Course Requirements

(e.g: students should have a computer, internet connection, webcam, account on a specific software/platform...etc):

24 Course Policies:



A- Attendance policies:

B- Absences from exams and submitting assignments on time:

C- Health and safety procedures:

D- Honesty policy regarding cheating, plagiarism, misbehavior:

E- Grading policy:

F- Available university services that support achievement in the course:

25 References:

A- Required book(s), assigned reading and audio-visuals:

1. C. A. Heaton, An Introduction of Industrial Chemistry, Blackie, Glasgow, 1991
2. H. White, Introduction to Industrial Chemistry, Wiley-interscience, New York, 1986

B- Recommended books, materials, and media:

1. P. Chenier Survey of Industrial Chemistry, Third Edition, Kluwer Academic / Plenum Publishers, New York, 2002,
2. H. A. Wittcoff, B. G. Reuben, J. S. Plotkin, Industrial Organic Chemicals, Second Edition, John Wiley, Wiley-Interscience, 2004.
3. K. Weissmehl, H.-J. Arpe, Industrial Organic Chemistry, Second Edition, VCH, Weinheim, Germany, 1993
4. Basic Organic Chemistry Part 5: Industrial Products, J. M. Tedder, A. Nechvatal, A. H. Jubb, John Wiley, Chichester, 1975

26 Additional information:

Name of Course Coordinator: ----Imad Hamadneh-----Signature: ----- Date: ----- ---
Head of Curriculum Committee/Department: ----- Signature: ----- ---
Head of Department: ----- Signature: ----- -
Head of Curriculum Committee/Faculty: ----- Signature: ----- -
Dean: ----- Signature: -----