



Course Syllabus

1	Course title	INDUSTRIAL CHEMISTRY I	
2	Course number	0303351	
3	Credit hours	3	
	Contact hours (theory, practical)	3+0	
4	Prerequisites/corequisites	Physical Chemistry I	
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)	1 st semester 2023-2024	
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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18 Other instructors:

Name:

Office number:

Phone number:

Email:

Contact hours:

Name:

Office number:

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Contact hours:

19 Course Description:

This course covers the basic consideration, characteristics of the chemical industry, material and energy balance, raw materials for the chemical industry, production processes for organic chemical industries, basic chemicals from petroleum, industrial polymers, detergents, chemical industrial process development, the technology of chemical processes, selected industrial processes



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. (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	CLO1 CLO 2	Face to Face	Classroom		1 st exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	1.2	characteristics	CLO1 CLO 2	Face to Face	Classroom		1 st exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	1.3	History	CLO1 CLO 2 CLO3	Face to Face	Classroom		1 st exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
2	2.1	Industrial Chemical Kinetics	CLO1 CLO 2	Face to Face	Classroom		1 st exam	Introduction of Industrial Chemistry,	

								Blackie, Glasgow, 1991	
	2.2	Reaction Control and orders	CLO1 CLO 2	Face to Face	Classroom		1 st exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	2.3	0 th , 1 st , and 2 nd order kinetics	CLO1 CLO 2	Face to Face	Classroom		1 st exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
3	3.1	Industrial Catalysis and Catalysts: Kinetics of industrial catalytic processes	CLO1 CLO 2 CLO3	Face to Face	Classroom		1 st exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	3.2	Structure and preparation.	CLO1 CLO 2	Face to Face	Classroom		1 st exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	3.3	heterogeneous catalysts	CLO1 CLO 2	Face to Face	Classroom		1 st exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
4	4.1	Industrial Separation Processes	CLO1 CLO 2 CLO3	Face to Face	Classroom		1 st exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	4.2	Phase separation	CLO1 CLO 2 CLO3	Face to Face	Classroom		1 st exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	4.3	Distillation, Extraction.	CLO1 CLO 2	Face to Face	Classroom		1 st exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
5	5.1	Energy Introduction, Classification of fuels.	CLO1 CLO 2	Face to Face	Classroom		1 st exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	5.2	Calorific value of a fuel.	CLO1 CLO 2	Face to Face	Classroom		1 st exam	Introduction of Industrial Chemistry,	

								Blackie, Glasgow, 1991	
	5.3	Types of energy used in the chemical industry.	CLO1 CLO 2	Face to Face	Classroom		2 nd Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
6	6.1	Organic Chemicals from Coal Origin of coal, Types of coal, Carbonization of coal.	CLO1 CLO 2	Face to Face	Classroom		2 nd Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	6.2	high and low-temperature carbonization	CLO1 CLO 2	Face to Face	Classroom		2 nd Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	6.3	Liquid fuels from coal (Coal hydrogenation)	CLO1 CLO 2	Face to Face	Classroom		2 nd Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
7	7.1	Gasification, Fuel gases	CLO1 CLO 2	Face to Face	Classroom		2 nd Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	7.2	water gas.	CLO1 CLO 2	Face to Face	Classroom		2 nd Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	7.3	natural gas.	CLO1 CLO 2	Face to Face	Classroom		2 nd Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
8	8.1	Syngas. Cracking processes.	CLO1 CLO 2	Face to Face	Classroom		2 nd Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	8.2	Reforming processes.	CLO2 CLO3	Face to Face	Classroom		2 nd Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	8.3	Direct oxidation.	CLO 2	Face to Face	Classroom		2 nd Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	

9	9.1	II-Primary Petrochemicals I Alkanes, Alkenes, and Alkynes Methane and carbon monoxide,	CLO 2	Face to Face	Classroom		2 nd Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	9.2	C2-C3, Acetylene, Ethylene, Propylene.	CLO1 CLO 2	Face to Face	Classroom		2 nd Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	9.3	C4 hydrocarbons	CLO1 CLO 2	Face to Face	Classroom		2 nd Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
10	10.1	III-Primary Petrochemicals II Aromatic hydrocarbons Introduction	CLO1 CLO 2	Face to Face	Classroom		2 nd Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	10.2	Manufacturing routes, Benzene,	CLO1 CLO 2	Face to Face	Classroom		2 nd Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	10.3	Manufacturing routes, Xylenes, Cumene	CLO1 CLO 2	Face to Face	Classroom		2 nd Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
11	11.1	Dyestuff Industry-organic	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	Dyestuff Industry-inorganic	CLO1 CLO 2	Face to Face	Classroom		2 nd Exam	C. A. Heaton, An Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	11.3	Polymer Industry,	CLO1 CLO 2	Face to Face	Classroom		Final Exam	C. A. Heaton, An Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	

	12.1	classifications	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	Elastomer's	CLO1 CLO 2	Face to Face	Classroom		Final Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
13 14	13.2	Natural & Synthetic Elastomers	CLO1 CLO 2	Face to Face	Classroom		Final Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	13.3	Chemical synthesis of elastomers	CLO1 CLO 2	Face to Face	Classroom		Final Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	14.1	Cellulose and Paper Industry	CLO 2 CLO3	Face to Face	Classroom		Final Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
14 15	14.2	Fibers	CLO 2 CLO3	Face to Face	Classroom		Final Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	14.3	Detergent Industry.	CLO1 CLO 2 CLO3	Face to Face	Classroom		Final Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
	15.1	Chemical Industry in Jordan: Introduction	CLO 2 CLO3	Face to Face	Classroom		Final Exam	Introduction of Industrial Chemistry, Blackie, Glasgow, 1991	
15	15.2	NaCl, KCl	CLO 2 CLO3	Face to Face	Classroom			Introduction of Industrial Chemistry,	

								Blackie, Glasgow, 1991	
	15.3	Phosphate industry	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%	1.The Chemical Industry Characteristics, History 2.Industrial Chemical Kinetics and Reaction Control , Batch processes, Continuous processes, Industrial Catalysis and Catalysts 3.Industrial Separation Processes , Phase separation, Distillation, Extraction.	CLO1 CLO 2 CLO3	5 th week	In the department
2 nd exam	20%	Energy: Classification of fuels. Organic Chemicals from Coal , and petrol Organic Chemicals from Petroleum and Natural Gas. Preparation of Primary Petrochemicals	CLO1 CLO 2 CLO3	10 th week	In the department



Final	50%	Industrial Chemical Kinetics and Reaction Control Industrial Separation. Energy, Organic Chemicals from Coal, and petrol Organic Chemicals from Petroleum and Natural Gas. Dyestuff Industry, Paper and Cellulose Industry, Polymer Industry, Detergent Industry	CLO1 CLO 2 CLO3	17 th week	In the department
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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. 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. Jubbe, 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: -----