هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification
(Bachelor)

Course Title:	Chemistry of Inorganic Industries
Course Code:	ICHM354-2
Program:	Bachelor of Science in Industrial Chemistry
Department:	Department of Physical Sciences
College:	College of Science
Institution:	Jazan University
Version:	TP-153 (2024)
Last Revision Date:	12/02/2024

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (2hrs)

2. Course type

A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required		☐ Elective		

3. Level/year at which this course is offered: (6th Level--- 3rd Year.)

4. Course general Description:

Course title	Course code	Contact Hours			Credit Hours	Year	Level	Prerequisite	Corequisite
		Lec	Tut	Lab					
Chemistry of Inorganic Industries	ICHM354-2	2	-	-	2	3rd	6th	CHEM326-3	None

This course aims to give the students theoretical principles of many industries with an inorganic basis such as glass, ceramics, mineral extraction and water purification.

5. Pre-requirements for this course (if any)**:**

CHEM326-3

6. Co-requisites for this course (if any)**:**

None

7. Course Main Objective(s):

1. **To recognize the Information about the importance of inorganic chemistry in the world today.**
2. **To describe the economic importance, methods of preparation of industrial inorganic materials.**
3. **To discuss the environmental impact of inorganic compounds and its importance in.**

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	30	100%
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	30
2.	**Laboratory/Studio**	
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)**	
Total		30

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding;** *Upon completion of the course, students are able to:*			
1.1	**Demonstrate a broad, knowledge in the Classify the chemical industry in terms of products, raw materials, water treatment, Ceramic Industry, Manufacture of glass, Pyrex and kimax , semiconductor manufacturing , Extraction of radioactive elements,...etc. (p)**	**K(1)**	***Lecture group work discussion***	***Objective Q***
1.2	**Describe with the help of relevant flow diagrams, equations, operating conditions and equipment principles, the manufacture of ammonia ,.....etc. (p)**	**K(2)**	**Lecture group work discussion**	**Short answer Questions**
2.0	**Skills;** *Upon completion of the course, students are able to:*			
2.1	**Demonstrate the knowledge and skills in Calculate the amount of raw materials produced in industrial processes. (p)**	**S(1)**	**lecture / discussion / Seminars /Individual presentation**	**Essay Q**
2.2	***Communicate scientific information and research findings effectively in writing (laboratory notebooks, laboratory reports, research papers, etc.) or orally, using clear and concise scientific language.(p)***	**S((5)**	**lecture Expository and Discovery Teaching Interactive Discussions.**	**Research presentation rubric**
3.0	**Values, autonomy, and responsibility;** *Upon completion of the course, students are able to:*			
3.1	**Act with integrity and good ethics in chemistry profession and their obligation to society (p)**	**V(2)**	**cooperative learning Self-study Oral presentation**	**Ethic Rubric check**

C. Course Content

No	List of Topics	Contact Hours
1.	Water: water quality - non-salt water treatment - wastewater treatment - seawater desalination - water pollution	3
2.	Mining: concentration of ores - thermal extraction of metals - extraction of metals from aqueous solutions - electrical extraction - extraction by thermite reaction	4
3.	High-tech metals: thermal technology - electrical technology - chemical technology	3
4.	Ceramic industry - superconductive ceramics	3
5.	Manufacture of glass, Pyrex and Chemax	3
7.	Extraction of ultra-pure elements to manufacture semiconductors	2
8.	Extraction of radioactive elements: (ion exchange - use of solvents)	2
9.	Manufacture of acids: nitric - hydrochloric - sulfuric	2
10	Manufacture of inorganic fertilizers	2
11.	Manufacture of gases (ammonium - chlorine - carbon monoxide - carbon dioxide)	4
12.	Detergent industry.	2
Total		$2 \times 15w = 30$

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	*Periodic Exams*	*During Semester*	*30%*
2.	*Assignments & Classroom Activities*	*During Semester*	*20%*
6.	*Final Exam*	*16-17*	*50%*
	Total		*100%*

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	*1-Mark Anthony Benvenuto, De Gruyter Textbook, Industrial Inorganic Chemistry, 2015.* *1. أسس الكيمياء الصناعية، محمد مجدي واصل، دار الفجر للنشر والتوزيع، 2003.*
Supportive References	*1. الصناعات الكيميائية، احمد مدحت عبد السلام، الكيمياء الصناعية – دار المعارف عام 1967* *2. Peter Atkins and Julio de Paula,2005, The elements of physical chemistry.*

	3. *T. W. Swaddle, Inorganic Chemistry , An Industrial and Environmental Perspective, Academic Press, 1997.* 4. *K. H. Büchel, H-H. Moretto, D. Werner, P. Woditsch, Industrial Inorganic Chemistry, Wiley, 2006.*
Electronic Materials	**Some course contents and materials are posted on Black board sites**
Other Learning Materials	***https://chem.libretexts.org/Special:Search?qid=&fpid=230&fpth=&query=industrial&type=wiki***

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	*1 Lecture room(s) for groups of 50 students*
Technology equipment (projector, smart board, software)	*Smart board, Data show, Black board, internet*
Other equipment (depending on the nature of the specialty)	*none*

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Student	Likert-type Survey CES) Indirect
Effectiveness of Students' assessment	Instructor & Course coordinator	Class room evaluation (direct & indirect
Quality of learning resources	Program coordinator	Indirect
The extent to which CLOs have been achieved	Assessment committee	Indirect
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Physical Sciences Department Council
REFERENCE NO.	Meeting (3)
DATE	12/03/2024 -02/09/1445