هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification
(Bachelor)

Course Title:	Industrial Catalysis
Course Code:	ICHM459-2
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:	*Pick Revision Date.*

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: 7 (8th Level--- 4th Year.)

4. Course general Description:

Course title	Course code	Contact Hours			Credit Hours	Year	Level	Prerequisite	Corequisite
		Lec	Tut	Lab					
Industrial Catalysis	ICHM459-2	2	0	0	2	4th	8TH	ICHM356-3	---

This course aims to give the student the basic information and principles basics for catalytic materials uses in various industrial applications.

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

ICHM356-3

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

None

7. Course Main Objective(s):

1- Identify the history of industrial chemistry industrial catalysis classification according to various criteria: structure, composition, area of application, or state of aggregation.
2- Understanding modern techniques for forming catalytic compounds.
3-Identify the fluid catalytic cracking, hydro processing (hydrocracking and hydrotreating), isomerization, alkylation, and others
4- Familiarity with various methods for development of preparing industrial homogeneous catalysis.
5- Study the various process of catalyst regeneration and recycling.
6- Development of new preparation processes
8- Shape-selective catalysis with different materials

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	$(2 \times 15) = 30$	100%
2	E-learning		

No	Mode of Instruction	Contact Hours	Percentage
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 comprehensive understanding and critical perspective on the key principles, concepts, and terminology of industrial catalysis. (M)***	**K 1**	***Lecture discussion***	***Exams Assignments***
1.2	***Describe and explain industrial catalysis, practical procedures, tools, and techniques related to industrial catalysis. (M)***	**K 2**	***Lecture discussion***	***Exams Assignments***
2.0	**Skills;** *Upon completion of the course, students are able to:*			
2.1	***Identify and solve problems using appropriate principles, methodologies, tools, and modelling related to industrial catalysis. (M)***	***S 1***	***Lecture discussion***	***Exams Assignments***
2.2	***Communicate scientific information and research findings effectively in writing on***	***S5***	***Lecture discussion web-based activity***	***Assignments Classroom activities***

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	industrial catalysis. (M)		*presentation*	
3.0	**Values, autonomy, and responsibility;** *Upon completion of the course, students are able to:*			
3.1	*Recognize a chemist's ethical and scientific responsibilities. (M)*	*V2*	*web-based activity presentation*	*presentation*

C. Course Content

No	List of Topics	Contact Hours
1.	*Basic concepts in industrial catalysis definition and importance.*	*4*
3.	*Different methods for preparation of industrial catalysis.*	*4*
4.	*immobilized catalysts*	*4*
5.	*The suitability of a catalyst for an industrial process*	*4*
6.	*catalytic reforming; hydrotreatment; Oil refineries; fluid catalytic cracking; and alkylation.*	*5*
	Heterogeneous catalysis and development of organometallic catalysts	*4*
7.	*Recent materials which uses in industrial applications*	*5*
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, Heinz Plaumann Industrial Catalysis.2021. ISBN 978-3-11-054284-4. e-ISBN (PDF) 978-**

	3-11-054286-8. e-ISBN (EPUB) 978-3-11-054294-3 **2- Martin Schmal, Heterogeneous Catalysis and its Industrial Applications,** **ISBN 978-3-319-09249-2 . ISBN 978-3-319-09250-8 (eBook)** **DOI 10.1007/978-3-319-09250-8**
Supportive References	**Industrial Catalysis: A Practical Approach.** **Jens Hagen. September 2015. e PDFISBN: 978-3-527-68465-6** **oBook ISBN: 978-3-527-68462-5**
Electronic Materials	
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	***1 Lecture room.***
Technology equipment (projector, smart board, software)	***Smartboard, Data show, Blackboard, internet***
Other equipment (depending on the nature of the specialty)	***Saudi Digital Library***

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