هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification
(Bachelor)

Course Title:	Chemistry of Downstream Industries
Course Code:	ICHEM458-2
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:	

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (3 hrs.)

2. Course type

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

3. Level/year at which this course is offered: (8th Level--- 4th Year.)

4. Course general Description:

Course title	Course code	Contact Hours			Credit Hours	Year	Level	Prerequisite	Corequisite
		Lec	Tut	Lab					
Chemistry of Downstream Industries	ICHEM 458-2	2	-	-	2	4th	8th	ICHEM251-3	--

This course will provide an overview of the chemical processes and principles involved in downstream industries, including petrochemicals, polymers, pharmaceuticals, and other related sectors. Students will learn about the chemical reactions, transformations, and materials used in these industries, as well as the environmental and safety considerations.

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

ICHEM251-3

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

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7. Course Main Objective(s):

1. **Understanding the chemical processes involved in downstream industries.**
2. **Identifying the materials and products produced in downstream industries.**
3. **Analyzing the environmental and safety considerations in downstream industries.**
4. **Evaluating the impact of downstream industries on society and the economy**

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		
3	Hybrid		

No	Mode of Instruction	Contact Hours	Percentage
	• 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 of the principles and concepts of*** **the chemical processes involved in downstream industries.** ***(M)***	**K(1)**	***Lecture / Open discussion in class***	***Objective Questions***
1.2	***Describe and explain correctly the materials and products produced in downstream industries. (M)***	**K(2)**	***Lecture / Open discussion in class***	***Objective questions, Essay questions***
2.0	**Skills;** *Upon completion of the course, students are able to:*			
2.1	***Evaluate the impact of downstream industries on society and the economy. (M)***	**S(1)**	***lecture / Open discussion in class***	***Essay questions, Solving problems***
2.2	***Make effective use of communication, and online technology about the course topics in order to improve their basic knowledge in writing (report /***	**S(5)**	***project-based learning***	***Research presentation rubric***

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	poster) with a good verbal and clear scientific language. (M)			
3.0	**Values, autonomy, and responsibility;** *Upon completion of the course, students are able to:*			
3.1	***Recognize the chemist's professional and ethical responsibilities. (I)***	**V(2)**	***Research activities***	***Ethic Rubric check***

C. Course Content

No	List of Topics	Contact Hours
1.	**Introduction to Downstream Industries**	5
2.	**Petrochemicals and Refining Processes**	5
3.	**Polymers and Plastics Production**	5
4.	**Pharmaceuticals and Drug Manufacturing**	5
5.	**Industrial Catalysts and Chemical Reactions**	5
6.	**Environmental and Safety Regulations in Downstream Industries**	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. Chemical Process Technology, Jacob A Moulijn, Michiel Makkee, Annelies E Van Diepen, Wiley; 2nd Revised, 2013.**
Supportive References	**1. Industrial Chemical Cresols and Downstream Derivatives, Asim Kumar Mukhopadhyay, 2004, CRC Press.** **2. "Introduction to Polymer Science and Technology" by Nicholas Peppas**

Electronic Materials	**Some course contents and materials are posted on Black board sites**
Other Learning Materials	

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)	Data show
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