هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification
(Bachelor)

Course Title:	Nanotechnology
Course Code:	ICHM451-2
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:	1 March 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: (7th Level--- 4th Year.)

4. Course general Description:

Course title	Course code	Contact Hours			Credit Hours	Year	Level	Prerequisite	Corequisite
		Lec	Tut	Lab					
Nanotechnology	ICHM 451-2	2	0	0	2	4th	7th	ICHM 356-3	---

This course aims to give the student the basic information and principles for understanding nanomaterials in terms of preparation, diagnosis, and their various applications in chemistry and other sciences.

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

ICHM 356-3

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

none

7. Course Main Objective(s):

1- Identify the nano-scale and ultrafine materials and their development.
2- Understanding modern techniques for forming nano-sized compounds.
3- Identify the elemental and chemical composition of nanomaterials.
4- Familiarity with various methods for preparing nanomaterials.
5- Study the various applications of nanomaterials.

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 • Traditional classroom		

No	Mode of Instruction	Contact Hours	Percentage
	• 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		....

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 nanomaterial.(M)***	**K 1**	***Lecture discussion***	***Exams Assignments***
1.2	***Describe and explain correctly nanomaterial, practical procedures, tools, and techniques related to industrial chemistry.(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 nano-chemistry. (M)***	S 1	***Lecture discussion***	***Exams Assignments***
2.2	***Communicate scientific information and research findings effectively in writing on nanomaterials. (M)***	S5	***Lecture discussion web-based activity presentation***	***Assignments Classroom activities***
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 nanomaterials definition and importance.*	4
2.	*Different methods for preparation of nanomaterials.*	4
3.	*Properties of different types of nanomaterials.*	4
4.	*laboratory methods for preparing nanomaterials.*	4
5.	*various applications of nanomaterials in chemistry and other sciences*	5
6.	*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. *K.W. Kolasinski, "Surface Science: Foundations of Catalysis and Nanoscience", Wiley, 2002.* 2. *G.A. Ozin and A.C. Arsenault, "Nanochemistry: A chemical approach to nanomaterials", Royal Society of Chemistry, 2005.* 3. *M. Kuno, Introductory Nanoscience, Garland Science, Taylor and Francis Group, 2012.*
Supportive References	
Electronic Materials	
Other Learning Materials	*https://chem.libretexts.org/Special:Search?qid=&fpid=230&fpth=&query=nanomaterials&type=wiki*

2. Required Facilities and equipment

Items	Resources

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture room(s) for groups of 50 students
Technology equipment (projector, smart board, software)	Smartboard, Data show, Blackboard, internet
Other equipment (depending on the nature of the specialty)	

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