Course Specification

(Postgraduate Programs)

Course Title:	**Advanced Inorganic Chemistry Applications**
Course Code:	**CHM 6217**
Program:	**Master of science in chemistry**
Department:	**Chemistry**
College:	**Science**
Institution:	**Imam Mohammad Ibn Saud Islamic University**
Version:	*Course Specification Version Number*
Last Revision Date:	*Pick Revision Date.*

Table of Contents

A. General information about the course:

1. Course Identification:

1. Credit hours: 3 (3 Lectures, 0 Lab, 0 Tutorials)					
2. Course type					
A.	☐University	☐College	☐Department	☐Track	
B.	☐Required		☒ Elective		
3. Level/year at which this course is offered: (Level 1/Year 2)					
4. Course General Description:					
The course aims to provide students with advanced knowledge related to the utilization of various inorganic materials in some advanced industrial fields, which helps to localize these industries in the future.					
5. Pre-requirements for this course (if any)**:**					
Inorganic Molecular Spectroscopy – CHM 6111					
6. Co-requirements for this course (if any)**:**					
7. Course Main Objective(s):					
• **Recognize the metals and non-metals in industry.** • **Understand utilization of various inorganic materials in some advanced industrial fields.** • **Be familiar with inorganic applications in industries and life.**					

2. Teaching Mode: (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	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**	45
2.	**Laboratory/Studio**	0
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)……**	0
	Total	45

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	**To recall knowledge of selected metals and non-metals chemistry in industry.**	**K1. *Inorg*.; K2. *Inorg*.; K4. *Inorg***	• **Five hours/week lectures.** • **Self-study** • **Home-exam.**	• **Regular Exams** • **Assignments** • **Short Quizzes** • **Oral Discussion Participation.**
1.2	**To recognize the basic application of inorganic materials**	**K1. *Inorg*.; K2. *Inorg*.; K4. *Inorg*.;**	• **Five hours/week lectures** • **Think and justify application of inorganic materials., using available references (SDL) online.** • **Open discussion.**	• Oral Discussion marks • Literatures Survey • Mini-seminar. • Participation

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.3	**To state the new applications of inorganic materials.**	**K1. *Inorg.*; K2. *Inorg.*; K3. *Inorg.*;**	• **Five hours/week lectures.** • **Group Discussion on application of inorganic materials., using available references (SDL) online.**	• Midterm. • Assignments . • Group Discussions. • Literatures Survey. • Mini-seminar. Participation.
2.0	**Skills**			
2.1	**To analyze methods for studying metals and ligands applications**	**S1. *Inorg.*; S2. *Inorg.*; S3. *Inorg*.**	• **Lectures activity.** • **Self-study** • **Deep discussion application of inorganic materials.** • **Lectures activity.**	• Questions in Lectures. • Short Quizzes and Exams. • Open Discussions. • Participation • Mini-seminar.
2.2	**To compare the metals and ligand's role in the biological system functions.**	**S1. *Inorg.*; S4. *Inorg.*;**	• **Practice some examples for application of inorganic materials. In KSA achieving.** • **Brainstorming.** • **Self-study.**	• **Questions in Lectures.** • **Participation** • **Oral Discussion** • **Short Quizzes.**
2.3	**To operate communication to advanced inorganic chemistry applications and its importance,**	**S1. *Inorg.*; S3. *Inorg.*; S4. *Inorg*.**	• **Lectures** • **Oral Discussions.** • **Brainstorming.** • **Self-study**	• **Questions in Lectures.** • **Short Quizzes and Exams.**

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
	accompanying writing of mini-Reports, operating electronic mail, and Network in communicating with others.			• Oral Discussion. • Participation
3.0	**Values, autonomy, and responsibility**			
3.1	To perform a scientific presentation, research, and work independently and integrate with a collaborated group, Using IT to acquire, analyze, and communicate information.	V1. . *Inorg*.	• Brainstorming. • Exercises • Group Discussion. • Team work.	• Oral Discussion. • Group Discussion • Assignments.
3.2	To demonstrate his ability to the effectively collaboration and inter-professionalism in class discussions or team works, as well as independently.	V1. *Inorg*.; V2. *Inorg*.	• Small Group tasks • Open discussion at classroom. • Office hour guiding. • Group Presentation of mini projects	• Participation • Homework's • Mini-project(s).
...				

C. Course Content:

No	List of Topics	Contact Hours
1.	*Introduction,* Employment of inorganic materials and compounds in the fields of non-ferrous alloys.	5

2.	***Employment and uses of inorganic materials and compounds in advanced biomaterials branches, for example:*** **Ceramic and metal bone substitutes, as anti-bacterial such as titanium, wollastonite and copper, As anti-fungal and antivirals.**	**12**
3.	***Employment and uses of inorganic materials and compounds*** **in jet engines as well as parts of modern cars.**	**12**
4.	***Employment and uses of inorganic materials and compounds*** **in electrical insulators, as well as in the preparation and manufacture of parts for mobile phones as well as personal computers**	**8**
5.	***Employment and uses of inorganic materials and compounds*** **in the fields of water purification and fertilization.**	**8**
Total		**45**

D. Students Assessment Activities:

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	**Class Activities (Open Discussion, Mini-reports, Oral Presentation, solving questions)**	**weekly**	**30 %**
2.	**Midterm Exam**	**9th week**	**30 %**
3.	**Final Exam**	**Around 17th week**	**40 %**
4.	**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	***Advanced Components for Electric and Hybrid Electric Vehicles Workshop roceedings*** **October 27-28, 1993 Gaithersburg, Maryland** **K. L. Stricklett, Editor, United States Department of CommerceTechnology Administration National Institute of Standards and Technology NIST Special Publication 860.** ***BIOMATERIALS SCIENCE AND ENGINEERING*****, Edited by Rosario Pignatello. Published by InTech Janeza Trdine 9, 51000 Rijeka,**

	Croatia, First published August, 2011, Printed in Croatia, ISBN 978-953-307-609-6.
Supportive References	**None**
Electronic Materials	• **American Chemical Society (Relevant Journals)** • **Saudi Digital Library**
Other Learning Materials	• **Blackboard** • **Multimedia associated with the text book and the relevant websites.**

2. Educational and Research Facilities and Equipment Required:

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	**Each of the classroom should be equipped with a whiteboard and a projector, with a maximum of 20 students.**
Technology equipment (Projector, smart board, software)	**The rooms are equipped with data show, Smart Board, Wi-Fi access.**
Other equipment (Depending on the nature of the specialty)	**None**

F. Assessment of Course Quality:

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	**Students**	**Direct: Questionnaire.**
	Course Responsible	**Direct: Course e-Portfolio. Indirect: Second examiner checklist-Course report.**
	Peer Reviewer	**Direct: Questionnaire. Indirect: External assessor report.**

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of students' assessment	Program Leaders	Direct: Course e-Portfolio. Indirect: Course report.
Quality of learning resources	Students	Indirect: Second examiner checklist- Course report.
	Faculty (Academic Advisory- GCC)	Direct: course Entrance/Exit. Indirect: Observations - Accreditation review.
	Program Leaders	Direct: Course e-Portfolio. Indirect: Course evaluation survey- Observations- Syllabus review- Accreditation review.
	Course Responsible	
The extent to which CLOs have been achieved	Course Responsible	Direct: Exams - Course e-Portfolio. Indirect: Second examiner checklist- Course report.
	Program Leaders	Indirect: Exams.
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

G. Specification Approval Data:

COUNCIL /COMMITTEE	COUNCIL OF CHEMISTRY DEPARTMENT
REFERENCE NO.	10 (NO. 2/10)
DATE	21/04/1444- 15/11/2022