

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

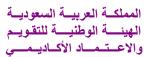
The National Commission for Academic Accreditation & Assessment

Inorganic Reaction Mechanism and Spectra

Course Specifications (CS)







Course Specifications

Institution: Umm Al-Qura University	Date of Report: 2017
College/Department : Faculty of Applied Science / Department	rtment of Chemistry

A. Course Identification and General Information					
1. Course title and code: Inorganic	Reaction Me	echanism and Spectra/402	24573-2		
2. Credit hours: 2 (theoretical)					
3. Program(s) in which the course i	s offered: Cl	hemistry			
(If general elective available in man	y programs	indicate this rather than l	ist programs)		
4. Name of faculty member respons	sible for the	course: Prof. Nashwa M a	hmoud El-Metwaly		
5. Level/year at which this course i	s offered: se	venth/fourth			
6. Pre-requisites for this course (if	any): Coord	ination Chemistry			
7. Co-requisites for this course (if a	ny): Nothing	g S			
8. Location if not on main campus:	both on El-A	Abedyah and El-Zaher			
9. Mode of Instruction (mark all that	at apply)				
a. Traditional classroom		What percentage?	100%		
b. Blended (traditional and onlin	e)	What percentage?	%		
c. e-learning		What percentage?			
d. Correspondence		What percentage?			
f. Other		What percentage?			
Comments:					



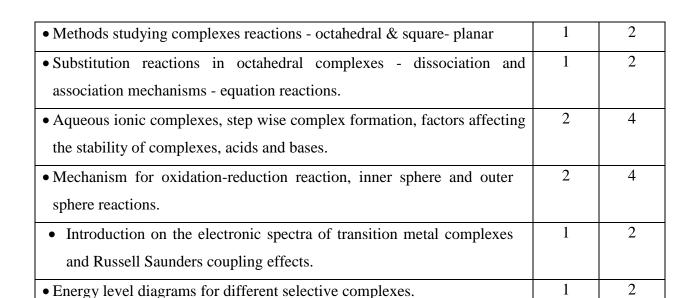
1. What is the main purpose for this course?

By the end of the study of this course students, will be aware fully with:

- a. The basic concepts of mechanism of inorganic reactions, including the substitution reactions of the ligands and some oxidation & reduction reactions.
- b. The basic concepts of the vibrational and electronic spectra of the transition metal complexes, which includes the charge transfer and ligand-field spectra.
- 2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)
- Using effective teaching in smart classes.
- E-learning system is being introduced and the students can download course material which can be helpful for him.
- Encourage students to make reports in the course subjects especially the spectra of transition metal complexes.

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered		
List of Topics	No. of	Contact
	Weeks	Hours
• Introduction on the basic concepts of inorganic reaction mechanism.	1	2
• The rate Laws for several inorganic chemistry reactions.	1	2
Labile and inert complexes	1	2
Reaction mechanisms of ligand substitution.	1	2
Substitution reactions in square planar complexes, trans effect and the theories for it's explanation.	1	2
Reactions include the substitution of coordinating water	1	2



2. Course components (total contact hours and credits per semester):							
	Lecture	Tutorial	Laboratory	Practical	Other:	Total	
Contact Hours	28	4	0	0	0	32	
Credit	2	0	0	0	0	2	

- 3. Additional private study/learning hours expected for students per week.
- 2 additional hours.
- 4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy
- Brief summary of the knowledge or skill to develop;
- A description of the teaching strategies to be used in the course to develop that knowledge or skill;
- -The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

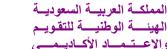


	NQF Learning Domains	Course Teaching			Course Assessment	
	And Course Learning Outcomes	Strategies			Methods	
1.0	Knowledge					
1.1	Know several concepts and principles related	l to	- Lectures using	new	- First Midterm	
	inorganic reaction mechanism such as com	plex	techniques.		Exam : 20 %	
	geometries.		- Meeting indivi	dual	- Second Midterm	
1.2	Recall the history and aims of studying inorgo	anic	students and group	s to	Exam: 20 %	
	reaction mechanism.		solve their probl	ems	- Activities and	
1.3	Understand the chemical behavior of chemical	ical	related to the course.		assignments on e-	
	compounds during chemical reactions.		- Assignments on	E-	learning site: 10 %	
1.4	Know the scientific data and solving problems		learning.		- Final Exam: 50%	
	related to qualitative and quantitative information	١.				
2.0	Cognitive Skills		I			
2.1	Use the Internet for more information related to	-N	Taking connections	-I	Discussing and	
	the course.	be	between different		evaluating the topics	
2.2	Develop English language skills and symbolic	co	ncepts across the	th	nat students learn	
	thinking skills.	do	mains.	fr	com their textbooks	
2.3	Improve reasoning, perception, and intuition	J - [Jsing charts and	aı	nd other sources.	
2.4	Develop attention, memory, self-regulation, and	co	ncept maps.	-	Solving general	
	motor executive functions.	- A	- Assigning research chemistry pro		hemistry problems	
2.5	Interpret, analyze, summarize, and evaluating the	qu	estions that can be	re	elated to qualitative	
	scientific materials.	an	answered through and quantitative		nd quantitative	
2.6	Demonstrate good understanding and retention	collecting and analyzing information at the e			nformation at the end	
	of basic and advanced chemical principles.	da	data. of each topic.			
		- S	Summarizing the	-	Individual	
		fin	ndings of the online	as	ssignments or oral	
		res	search	e	xam for	



			- Class discussions.	developing/solving a
			- Using the Internet to	task
			create learning activities.	- Midterm Exams and
				Final examination at
				the end of semester.
3.0	Interpersonal Skills & Responsibility		I	
Not	Applicable			
4.0	Communication, Information Technology	, Num	erical	
4.1	Communicating personal ideas and	- usin	g computer science in	-Follow up the project
	thoughts	finishing reports and other		progress
4.2	Responding to class discussions	related subjects		- Evaluation of the
4.3	Developing teamwork skills	- Group working.		duties associated with
4.4	Collaboration to finish team assignments	- Mini seminars prepared by the		the appropriate use of
4.5	What relation of Data, Information, and	students to present their team comm		communication skills
	Knowledge	projects or reports.		- Assessments of
		- Visiting the University library		student's assignments
		and different web-sites to obtain - e		- evaluate solving the
		some	related subjects	equations and
				problems related to
				subjects
5.0	Psychomotor: Not Applicable			

5. Sche	5. Schedule of Assessment Tasks for Students During the Semester						
	Assessment task (e.g. essay, test, group project,	Week	Proportion of Total Assessment				
	examination, speech, oral presentation, etc.)	Due					
1	Homework or activities.		10 %				
2	First Periodic Exam.	6	20 %				
3	Second Periodic Exam.	12	20 %				



4	Final Exam. (2 hours exam)	16	50 %
5	Total	100 %	

D. Student Academic Counseling and Support

- 1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)
- Two office hours per week for each group of students.

E. Learning Resources

- Robert B. Jordan, Reaction Mechanisms of inorganic and organometallic systems, 3rd, Oxford University press, 2007
- Smiljko Asperger, Chemical Kinetics and inorganic reaction mechanisms, 2ed, Kluwer Academic / Plenum Publisher 2003
- Kazuo Nakamoto , Infrared and Raman Spectra of Inorganic and Coordination Compounds, John Wiley & Sons , 2009
- 2. List Essential References Materials (Journals, Reports, etc.)
- "Kinetics and Mechanisms of Reaction of Transition Metal Complexes," Ralph G. Wilkins, 2nd Thoroughly Revised Edition, VCH Publishers, 1992, ISBN 9783527282531 (Online book access at http://onlinelibrary.wiley.com/book/10.1002/3527600825)
- 2- "Ligand Substitution Processes," C.H. Langford and H.B. Gray, W.A. Benjamin, Inc., 1966 (Online book access at http://caltechbook.library.caltech.edu/100/1/Langford_Lsp.pdf)
- 3- Lecture Synopsis at http://www.chem.ox.ac.uk/icl/dermot/mechanism1/
- 3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)
 - Robert B. Jordan, Reaction Mechanisms of inorganic and organometallic systems, 3rd, Oxford University press, 2007
 - Smiljko Asperger, Chemical Kinetics and inorganic reaction mechanisms, 2ed, Kluwer Academic / Plenum Publisher 2003
 - Kazuo Nakamoto, Infrared and Raman Spectra of Inorganic and Coordination Compounds, John

Wiley & Sons, 2009

- 4. List Electronic Materials (eg. Web Sites, Social Media, etc.)
- 1- "Kinetics and Mechanisms of Reaction of Transition Metal Complexes," Ralph G. Wilkins, 2nd Thoroughly Revised Edition, VCH Publishers, 1992, ISBN 9783527282531 (Online book access at http://onlinelibrary.wiley.com/book/10.1002/3527600825)
- 2- "Ligand Substitution Processes," C.H. Langford and H.B. Gray, W.A. Benjamin, Inc., 1966 (Online book access at

http://caltechbook.library.caltech.edu/100/1/Langford_Lsp.pdf)

- 3- Lecture Synopsis at http://www.chem.ox.ac.uk/icl/dermot/mechanism1/
- 5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.
- Isisdraw and Chemdraw and Chemoffice
- -MS-Office Software

http://scholle.oc.uni-kiel.de/herges/modeling/gliederung.html

http://phycomp.technion.ac.il/~ira/types.html

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

- 1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)
- A classroom containing at multi seats and equipped with projector and Internet access (scheduled for 2 hours once a week).
- 2. Computing resources (AV, data show, Smart Board, software, etc.)
- Common computer labs connected directly with internet are available for all students with high speed internet access
- 3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)
- Programs for chemical uses.



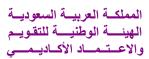
- Internet access for students.

G Course Evaluation and Improvement Processes

- 1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching
- Discussion groups of students to learn positives and negatives of all aspects of the scheduled Options.
- Questionnaires assessing students and the work of statistics showing the extent of efficiency and take advantage of the scheduled
- 2. Other Strategies for Evaluation of Teaching by the Program/Department Instructor
- Self assessments for performance from department
- Continuous questioners conducted by University and introduce the results to each member to investigate it and take care with the comments
- Independent review from specialists inside the department
- 3 Processes for Improvement of Teaching
- Developing the subject topics periodically
- Workshops on teaching methods.
- Review of teaching strategies.
- 4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)
- Check marking of a sample of exam papers, or student work.
- Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.
 - 5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.
 - Perform the necessary changes based on the feedback from the statistical analysis of the student grades.

Periodic revision of the course from concerned parties in the department and college, and improving it





according to what is known in distinguished universities worldwide.

- Perform the necessary changes based on the feedback from the workshops, conferences, and seminars recommendations.
- Perform the necessary changes based on the feedback from the experts in the field and faculty members.

Faculty or Teaching Staff: Prof. Nashwa Mahmoud El-Metwaly

Signature: Date Report Completed: 12/1/2019

Received by: Dr. Ismail Althagafi Department Head

Signature: Date: 20/1/2019