



ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

**Course Specifications
(CS)**

Nanochemistry

4024584-2





Course Specifications

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

A. Course Identification and General Information

1. Course title and code: Nanochemistry / 4024584-2	
2. Credit hours: 2 (theoretical)	
3. Program(s) in which the course is offered. Chemistry and Industrial Chemistry (If general elective available in many programs indicate this rather than list program)	
4. Name of faculty member responsible for the course: Prof. Dr Abd El Rahman Khedr	
5. Level/year at which this course is offered: 8/4 th	
6. Pre-requisites for this course (if any) surface chemistry	
7. Co-requisites for this course (if any)	
8. Location if not on main campus: both on El-Abedyah and El-Zaher	
9. Mode of Instruction (mark all that apply)	
a. Traditional classroom <input checked="" type="checkbox"/>	What percentage? 100%
b. Blended (traditional and online) <input type="checkbox"/>	What percentage? <input type="text"/>
c. e-learning <input type="checkbox"/>	What percentage? <input type="text"/>
d. Correspondence <input type="checkbox"/>	What percentage? <input type="text"/>
f. Other <input type="checkbox"/>	What percentage? <input type="text"/>
Comments:	

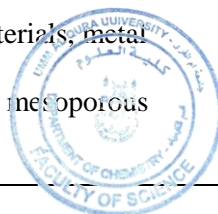


B Objectives

<p>1. What is the main purpose for this course? Make the students acquainted to the basic concept of nanochemistry and changes of chemical and physical properties due size reduction, and the terminology related to science, nanomaterials and nanotechnology. The students will study the methods of nanoparticle preparation, the most recent tools of nanomaterials characterization, the applications and fictionalization of nanomaterials.</p>
<p>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)</p> <p>The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course.</p>

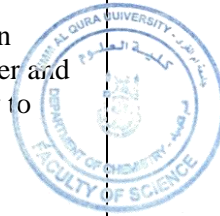
C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact Hours
General introduction and history of nanotechnology. Importance of the nanoparticles in industries and in our lives.	3	6
Approaches in nanotechnology and typical syntheses of nanoparticles. Properties of nanomaterials, chemical and physical property. Reasons for changing the properties.	2	4
Classification of nanostructured and the chemical and physical properties of different nanostructured. Carbon Based Nanomaterials (Fullerenes, carbon-nanotubes and graphene)	3	6
exam	1	2
<ul style="list-style-type: none"> ▪ Nanomaterial based catalysts (inorganic nano materials, metal oxide supports, supported nano metal catalysts). ▪ Methods of preparation of nano-formulations and mesoporous materials 	2	4





<ul style="list-style-type: none"> Nanoparticle synthesis and fixtures nanoparticles and nanocolloids: Basic synthesis and fabrication methods for nanomaterials (CVD, impregnation, sol-gel, microemulsion, template, hydrothermal) titanium nanotubes with and without palladium, silver and gold nanoparticles and some other fixtures Spectroscopic and microscopic tools used in nanomaterials characterizations 	2	4
<ul style="list-style-type: none"> General industrial applications for nanoscale systems and fixtures, nano-optic applications, bio-nanotechnology applications and medical nanotechnology applications Nanotechnology and clean technologies: What is a clean technology challenges facing us in the areas of energy, water and environment, exploring the contribution of nanotechnology to solve these problems, the current obstacles faced by nanotechnology. 	2	4
Final exam	1	2



2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28					28
Credit	2					2

3. Additional private study/learning hours expected for students per week.2hr

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	Knowledge		
1.1	Recognize the methods of nanoparticles preparation	<ul style="list-style-type: none"> Lectures Scientific discussion Library visits Web-based study 	<ul style="list-style-type: none"> Exams web-based student performance systems
1.2	Name the some applications of nanomaterials in industry		



2.0	Cognitive Skills		
2.1	Compare between properties of nanomaterials	<ul style="list-style-type: none"> • Scientific discussion • Library visits • Web-based study 	<ul style="list-style-type: none"> • web-based student performance systems exams
2.2	Compare between methods of characterization of nanomaterials		
3.0	Interpersonal Skills & Responsibility		
	<ul style="list-style-type: none"> • Ability to communicate results of work to classmates. • Ability to work in a team to perform a specific task. 	<ul style="list-style-type: none"> • Scientific discussion • Library visits • Web-based study 	<ul style="list-style-type: none"> • web-based student performance systems • individual and group presentations
4.0	Communication, Information Technology, Numerical		
	<ul style="list-style-type: none"> • Interpret the results of characterization tools • Encourage students to use internet for searching certain electronic journals regarding topics of the course. • Scientific writing. 	<ul style="list-style-type: none"> • Scientific discussion • Library visits 	<ul style="list-style-type: none"> • web-based student performance systems • individual and group presentations
5.0	Psychomotor		
5.1	NOT APPLICABLE		
5.2			

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	First Periodic Exam.	6	20 %
3	Second Periodic Exam.	12	20 %
4	Final Exam.	16	50 %



5	Total	100 %
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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)

- **Presence of faculty members to provide consulting and advice.**
- **Office hours: during the working hours weekly, and the creation of appropriate means.**

E. Learning Resources

1. List Required Textbooks

1. Nanochemistry. G.B. Sergeev, K.J. Klabunde, Elsevier, **2013**, ISBN: 978-0-444-59397-9
2. Introduction to Nanoscience and Nanotechnology, Gabor L. Hornyak, H.F. Tibbals, Joydeep Dutta, John J. Moore, CRC Press. Copyright, 2009.
3. Nanomaterials and Nanochemistry, C. Bréchnignac, P. Houdy, M. Lahmani, Springer Science & Business Media. Copyright, 2006.
4. “Nanochemistry, A Chemical Approach to Nanomaterials”, G. Ozin and A. Arsenault, RSC (Royal Society of Chemistry), **2005**.
5. “Nanostructures and Nanomaterials”, G. Cao, Imperial College Press, **2004**
6. **Nanotechnology: Nanomaterials and Nanodevices, G. Mohan Kumar, Alpha Science International Ltd. 2015**

2. List Essential References Materials (Journals, Reports, etc.)

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

1. Nanochemistry. G.B. Sergeev, K.J. Klabunde, Elsevier, **2013**, ISBN: 978-0-444-59397-9
2. Introduction to Nanoscience and Nanotechnology, Gabor L. Hornyak, H.F. Tibbals, Joydeep Dutta, John J. Moore, CRC Press. Copyright, 2009.
3. Nanomaterials and Nanochemistry, C. Bréchnignac, P. Houdy, M. Lahmani, Springer Science & Business Media. Copyright, 2006.
4. “Nanochemistry, A Chemical Approach to Nanomaterials”, G. Ozin and A. Arsenault, RSC (Royal Society of Chemistry), **2005**.
5. “Nanostructures and Nanomaterials”, G. Cao, Imperial College Press, **2004**
6. **Nanotechnology: Nanomaterials and Nanodevices, G. Mohan Kumar, Alpha Science International Ltd. 2015**

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- <http://en.wikipedia.phys/wiki/Petroleum1>
- <http://www.chemhelper.com/>
- <http://www.chemweb.com/>



5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

Microsoft PowerPoint, Microsoft Word

- Videos on the chemistry of surfaces.
- Educational CD for surface Chemistry correlated with other themes

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.)

-classroom capacity (30) students.

2. Computing resources (AV, data show, Smart Board, software, etc.)

Hall equipped with a computer and the Data Show and Television is urgently required

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

No other requirements

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

Scheduled to complete the questionnaire calendar in particular.

- Focus group discussions with small groups of students.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

Feedback and assistance from colleagues.

- Independent evaluation of the extent to which students of the standards.

- independent advice to the duties and tasks

3 Processes for Improvement of Teaching

Workshops for the teaching methods.

- Continuous training for the faculty member.

- Revision of the proposed strategies.

- The provision of modern tools necessary for learning.

- Application of the means of e-learning.

- Exchange of internal and external experiences



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)

Checking the samples of test papers, or student work, which has been corrected by a faculty member.

- Exchange professors from different educational institutions on regular basis to correct samples of test papers

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

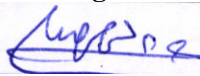
Consult with other professors teaches the same subject.

- Hosting a visiting professor to evaluate the subject.

- Workshops for teachers whom teach the same subject.

- Periodic review for teachers to modify the negatives contents in the subject.


Faculty or Teaching Staff: Prof. Dr Abd El Rahman Khedr

Signature: 

Date Report Completed: 12/1/2019

Received by: Dr. Ismail Althagafi

Department Head

Signature: 

Date: 20/1/2019

