

Kingdom of Saudi Arabia

The National Commission for

Academic Accreditation & Assessment



Course Specifications

Nuclear Chemistry

(402424-1)

Course Specifications

Institution: Umm Al-qura University	Date of Report: 2016
College/Department : Faculty of Applied Science / Chemistry Department	

A. Course Identification and General Information

1. Course title and code: Nuclear Chemistry / 402424-1	
2. Credit hours: 1 (theoretical)	
3. Program(s) in which the course is offered. Chemistry	
4. Name of faculty member responsible for the course: Dr. Aisha Yousif Eldawood	
5. Level/year at which this course is offered: 7th level/4th year	
6. Pre-requisites for this course (if any): - Chemistry of Transition Metals (402223-3)	
7. Co-requisites for this course (if any)---	
8. Location if not on main campus: All campus (El-Abedyah, El-Zaher and Elaziziah)	
9. Mode of Instruction (mark all that apply)	
a. Traditional classroom	What percentage?
b. Blended (traditional and online)	☒ What percentage? 100
c. e-learning	What percentage?
d. Correspondence	What percentage?
f. Other	What percentage?
Comments:	

B. Objectives

1. What is the main purpose for this course?

The goal of this course is to familiarize students with:

- The different types of radiations, the importance of nuclear chemistry and its applications.
- The radiation dissociation laws, the radiation displacement laws and nuclear binding energy.
- The nuclear fission, nuclear fusion and the linear accelerator.
- The transuranic elements and the methods of radiation measurement.

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 different learning sources of the course, so that the students make use of more than one reference.
- Encourage students to carry out reports in the field of nuclear chemistry.
- The use of smart teaching halls for lectures.

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
• Main differences between nuclear chemistry and nuclear physics.	1	1
• Importance of nuclear chemistry.	1	1
• Differences between chemical and nuclear reactions.	1	1
• Radiation displacement laws.	1	1
• Radiation dissociation and its types; types of radiations – α -rays, β -rays and γ -rays and their dissociations.	2	2
• Structure and stability of the nucleus – nuclear stability.	1	1
• Radiation dissociation laws and nuclear binding energy.	1	1

• Nuclear fission and nuclear fusion - the linear accelerator.	2	2
• Transuranic elements.	1	1
• Methods of radiation measurement.	1	1
• Applications of nuclear chemistry.	2	2

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	14	-		-		14
Credit	1	-		-		1

3. Additional private study/learning hours expected for students per week.
• Two hours a week to prepare reports, discuss and resolve questions related to nuclear chemistry.

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy
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	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	Knowledge		
1.1	Know the different types of radiations.	• Lectures • Scientific discussion • Use the library to work duties and a small research on nuclear chemistry.	• Written mid-term and final exams • Long and short essays.
1.2	Write on the importance of nuclear chemistry and its applications.		
1.3	Recall the radiation dissociation laws and nuclear binding energy.		
1.4	Describe the nuclear fission, nuclear fusion and the linear accelerator		
1.5	List the transuranic elements.		

		• Use of the Internet to carry out some reports on course subjects.	
2.0	Cognitive Skills		
2.1	Compare between chemical and nuclear reactions.	• Lectures • Scientific discussion • Library visits • Web-based study	• Periodic tests and assignments. • Measuring the response to the assignments.
2.2	Estimate the methods of radiation measurement		
2.3	Summarize the radiation displacement laws.		
2.4	Analyze the structure and stability of the nucleus as well as nuclear stability		
3.0	Interpersonal Skills & Responsibility		
3.1	Develop the student's ability in self-reliance and responsibility.	• Dividing students into groups to carry out collective scientific reports. • Periodic individual duties to develop the skill of taking responsibility and self-reliance	• Evaluate the results of collective works and duties as well as knowing the contribution of each individual through dialogue and discussion. • Assessment of individual tasks and duties to determine the student's ability to self-reliance.
3.2	Choose the suitable method to solve problems.		
3.3	Operate in team work and accept his college's opinions.		
4.0	Communication, Information Technology, Numerical		
4.1	Perform mathematical calculations and	• The use of	• Web-based student

	data analysis.	computers in the training room of the department.	performance systems
4.2	Use computers and the international information network (the Internet) to perform calculations and to identify recent research relevant to decision sources.	• Visiting research centers. • Using the internet for collecting data.	• Individual and group presentations. • Evaluation of the duties associated with the proper use of numerical and communication skills
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 and activities.	--	10%
2	Midterm 1 Exam.	6	20%
3	Midterm 2 Exam.	12	20%
4	Final Exam.	16	50%
5	Total	100%	

D. Student Academic Counselling 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)
 - Academic Advising for students.
 - Availability of Staff members to provide counselling and advice.

- Office hours: During the working hours weekly.

E. Learning Resources

1. List Required Textbooks

- Walter D. Loveland , David J. Morrissey and Glenn T. Seaborg “*Modern Nuclear Chemistry*”, New York, John Wiley & Sons Inc. (2006).

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

- David J. Morrissey, Walter D. Loveland and Glenn T. Seaborg “*Introductory Nuclear Chemistry*” New York, John Wiley & Sons Inc. (2001).

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

- J. Rydberg , J. O. Liljenzin and G. R. Choppin “*Radiochemistry and Nuclear Chemistry*” 3rd Edition, MA; Butterworth-Heinmann (2001)
- H.J. Arnikaar, “*Essentials of Nuclear Chemistry*” New Age International (P) LTd., Publishers, New Delhi (1995).
- Friedlander, “*Nuclear and Radiochemistry*” 5th. Edition, John Wiley & Sons (1992).

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

- <http://www.chemweb.com>
- <http://www.sciencedirect.com>
- <http://www.rsc.org>

- 5. Other learning material such as computer-based programs/CD, professional standards or regulations and software. : - Not required.

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.)

- Equipped lecture halls.

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

- Room equipped with computer, data show and TV.

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

- No other requirements.

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G. Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching	2 0 1 6
• Complete the questionnaire evaluation of the course.	
2. Other Strategies for Evaluation of Teaching by the Program/Department Instructor	
• Preparation of a course report and study of the results of the students to give us indication about the planned outputs and the extent to which student's benefits.	
3. Processes for Improvement of Teaching	
• Review of strategies proposed. • Providing new tools for learning. • Exchange of experiences internal and external. • Application of e-learning.	
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)	
• Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty. • Check marking of a sample of exam papers, or student work.	
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.	
• Workshops for teachers of the course. • Periodic review of the contents of the syllabus and modify the negatives. • Consult other staff of the course. • Hosting a visiting staff to evaluate of the course.	

Faculty or Teaching Staff: Dr. Aisha Yousif Eldawood

Signature:

Received by: Dr. Hatem Altass

Date Report Completed: 17/4/2016

Department Head

Signature: _____

Date: _____

