

معلومات المقرر * (Course Information):

اسم المقرر:	كيمياء نووية واشعاعية
رقم المقرر:	CHM437
اسم ورقم المتطلب السابق:	CHM24
اسم ورقم المتطلب المرافق:	لا يوجد
مستوى المقرر:	المستوى السابع
الساعات المعتمدة:	٣

Module Title:	Nuclear and radiochemistry
Module ID:	CHM 437
Prerequisite (Co-requisite):	CHM 242
Co-requisite:	None
Course Level:	٧th level
Credit Hours:	٣

وصف المقرر: Module Description

This course is designed to build a basic familiarity with natural radioactivity, The atomic nuclei, atomic structure, composition of nuclei, nuclear systematics and reactions. Nuclear masses, stability and angular momentum of nucleus. Radioactive decay. radioactive decay processes, alpha, beta and gamma decays. The structure of nuclei, nuclear models, nuclear forces, applications of radioactivity. Fission & fusion charge. It will emphasize nuclear and radiochemical methods applied to chemical analyses in the physical and biological sciences.

أهداف المقرر: Module Aims

1	For students undertaking this course, the aims are to Study the atomic nuclei, atomic structure, composition of nuclei , nuclear systematics and reactions
2	Study nuclear masses stability and angular momentum of nucleus
3	Knowledge Radioactive decay & radioactive decay processes(alpha, beta and gamma) decays.
4	Acquiring the student the different types of nuclear radiations
5	Knowledge the radioactivity of Nuclear Fission , Nuclear fusion
6	Acquiring the student radioactive series, radiation section and nuclear chemistry applications
7	Explain the Environmental behavior of radioactive substances
8	Apply the radiation protection and safety.
9	Knowledge the application of radiation technology



مخرجات التعليم: Learning Outcomes:

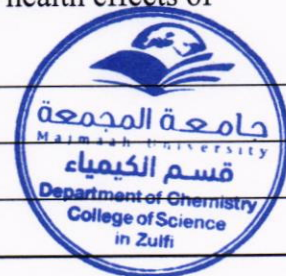


1	On completing this course, students will be able to : Identify the atomic mass, atomic number & write the nuclear coding	
2	Describe different radioactive radiations and the difference between chemical and nuclear reactions	
3	Apply the basic laws of radioactivity in solving related problems.	
4	Calculate the Q-values of various decay modes with the application of the selection rules for the allowed transitions.	
5	Learn how to search for information through library and internet to Participate Effective in the activities of the methodology	
6	Operate questions and communicate with teacher through solve problems and work in groups.	

Course Contents:

محتوى المقرر:

ساعات التدريس (Hours)	عدد الأسابيع (Weeks)	قائمة الموضوعات (Subjects)
3	1	Introduction and history of nuclear chemistry: Radioactivity, Radiation and Isotopes in Chemistry. Historical perspective on nuclear chemistry and radiochemistry.
9	3	Structure and properties of the atomic nucleus, nuclear systematics and reactions, Nuclear masses and stability, angular momentum of nucleus, nuclear models, nuclear forces
6	2	Radioactive Decay: mass-energy relationships and decay mechanisms. Types of radioactive decay and decay law, radioactive decay processes
3	1	alpha, beta and gamma decays, Interaction of radiation (α , β and γ rays) with matter
3	1	Nuclear Reactions. Particles, energetics and radionuclide production
3	1	Measurement of nuclear radiation,
6	2	Nuclear fission, charge and mass distribution, Mechanism of nuclear fission and nuclear reactors.
3	1	Environmental behavior of radioactive substances; Interaction of Radiation with Matter: Radiation detectors and health effects of radiation.
3	1	Radiation protection and safety
3	1	Application of radiation technology
3	1	Revision





Note: \ contact hour = 50 min.

الكتاب المقرر والمراجع المساندة: Textbook and References:

ISBN	سنة النشر Publishing Year	اسم الناشر Publisher	اسم المؤلف (رئيسي) Author's Name	اسم الكتاب المقرر Textbook title
10: 01240589733	2013	4 edition academic Press	Gregory Choppin, Jan- Olov Liljenzin, JAN RYDBERG and Christian Ekberg	Radiochemistry and Nuclear Chemistry, Fourth Edition , ,
	سنة النشر Publishing Year	اسم الناشر Publisher	اسم المؤلف (رئيسي) Author's Name	اسم المرجع Reference
	2001	2nd revised ed., Wiley-VCH, Berlin	KH Lieser	Nuclear and .Radiochemistry
ISBN: 978-3-527- 32901-4	2013	e-book	Jens-Volker Kratz, Karl Heinrich Lieser	Nuclear and Radiochemistry: Fundamentals and Applications, 2 Volume Set, 3rd Edition
ISBN-13 978-0-471- 11532-8 (cloth: alk. paper) ISBN-10 0-471- 11532-0 (cloth: alk. paper)	2006	A JOHN WILEY & SONS, INC., PUBLICATION	WALTER D. LOVELAND, DAVID J. MORRISSEY & GLENN T. SEABORG	Modern Nuclear Chemistry

Web Sites:

<http://pogil.org>

and <http://www.pcrest.com/PC/pub/index.html>

http://www.nap.edu/openbook.php?record_id=6160

* يتم تعبئة معلومات المقرر فقط باللغتين العربية والانجليزية وباقي المعلومات بلغة التدريس المعتمدة ويكرر لكل مقرر في الخطة الدراسية

* Course Information should be filled in Arabic and English. Other information should be filled using the approved teaching language at the college.