MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Nanotechnology**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**Che-23017**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level		2	**Semester of Delivery**		4
Administering Department		Chem	**College**	CoS	
Module Leader	Omer Kazi		**e-mail**	omerkazi@uodiyala.edu.iq	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor			**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/06/2023	**Version Number**		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	Teach students the nanotechnology, and know how to solve problems related to them. Clarification material and its description according to classical and modern theories And its practical applications aimed at developing and keeping pace with the scientific development of nanotechnology .Teaching and educating students on all the necessary and necessary information related to nanotechnology, which It qualifies them to work and research in all areas of nanotechnology
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Enable students to obtain knowledge and understanding of nanotechnology Enable students to obtain knowledge and understanding of Classification of nanomaterial .Enable students to obtain knowledge and understanding Characterization of nanomaterial .Enable students to obtain knowledge of Applications of nanomaterial in medicine , applications of nanomaterial in different fields
Indicative Contents المحتويات الإرشادية	Nanotechnology , classical and modern theories , Molecules, chemical bonds , Classification of nanomaterial , Characterization of nanomaterial , Applications of nanomaterial in medicine , applications of nanomaterial in different fields

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Method of lectures (clarification and explanation of the study materials) through the blackboard, smart board, and computer. -Providing students with the basics and additional topics related to previous education outcomes for skills to solve scientific problems. -Providing students with knowledge through homework and assignments for nanotechnology -Asking students to visit the library to obtain additional knowledge of the study materials. -Improving students' skills by visiting websites to obtain additional knowledge of the study subjects. -Asking students during the lecture to solve some application..

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	18	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**50**		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	10% (10)	8	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction of nanotechnology

Week 2	Material and its description according to classical and modern theories
Week 3	Molecules, chemical bonds,
Week 4	crystals, grains,
Week 5	Effect of particle size on the material properties
Week 6	Classification of nanomaterials
Week 7	Properties of nanomaterials
Week 8	**Midterm Exam**
Week 9	Synthesis of nanomaterials methods
Week 10	Characterization of nanomaterials(STM,XRD,SAXRD,)
Week 11	Characterization of nanomaterials(SEM,TEM)
Week 12	Characterization of nanomaterials(AFM,)
Week 13	Characterization of nanomaterials(UV-Visible)
Week 14	Characterization of nanomaterials(Raman spectroscopy)
Week 15	Applications of nanomaterials in medicine , applications of nanomaterials in different fields
Week 16	**Midterm Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	

Week 7	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	**Nanomaterials and Nanochemistry . Catherine Brechignac ,Philippe Houdy ,Marcel Lamani 2008**	Yes
Recommended Texts	**Nanochemistry ,Biotechnology, Nanomaterials, and Their Application,Olena Fesenko, Leonid Yatsenko ,2017**	No
Websites		

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.