MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Inorganic Chemistry III**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**Che-23114**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level		2	**Semester of Delivery**		3
Administering Department		Chem	**College**	CoS	
Module Leader	Khansa Yousif Ahmed		**e-mail**	khansa@uodiyala.edu.iq	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**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	Teaching the students all the necessary information about the Inorganic chemistry subject which make them able to work in the field of Inorganic Chemistry . Give idea about the periodic properties of the elements, study the molecular symmetry, study the standard electrode potential, study and classification of Acids and Bases, Explanation of Main elements in the periodic table from group 3 to 7. Study the basis of Solid State Chemistry including crystal system of Cube. Study the Magneto chemistry
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Students being able to understand Inorganic Chemistry ,understand Chemical structures of chemical compounds ,understand chemical reactions ,understand the experiments in Inorganic Chemistry .Skills of Knowledge- to remember , skills of analysis and skills of development.
Indicative Contents المحتويات الإرشادية	periodic properties such as ionic and atomic size. Ionization energy, electronegativity and electro affinity , Some periodic properties such as metallic and nonmetallic properties, oxidation state, oxides (acidic, basic and amphoteric) Oxides (Ionic, covalent and middle), Solid and Soft Acids and Bases

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Power point lecture method using data show and whiteboard. Explanation and clarification. Providing students with the basics and additional topics related to the outputs of inorganic chemical thinking and analysis. Forming discussion groups during lectures to discuss inorganic chemistry topics that require thinking and analysis. Asking students a set of thinking questions during the lectures such as what, how, when and why for specific topics. Giving students homework that requires self-explanations in causal ways.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**150**		

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	The arrangement of elements inside the periodic table and studying the periodic properties

	such as ionic and atomic size. Ionization energy, electronegativity and electro affinity
Week 2	Some periodic properties such as metallic and nonmetallic properties, oxidation state, oxides (acidic, basic and amphoteric) Oxides (Ionic, covalent and middle)
Week 3	Colors of elements and complexes
Week 4	Standard electrode potential, the relationship between standard electrode potential and the relationship with pH of the solution
Week 5	Types of Electromotive force and Disproportionation
Week 6	Giving examples
Week 7	Molecular Symmetry, the importance of symmetry. Operations and elements of symmetry. Point groups
Week 8	Midterm Exam
Week 9	Giving examples
Week 10	Acids and Bases
Week 11	Solid and Soft Acids and Bases
Week 12	Solid and Soft Acids and Bases
Week 13	Magnetochemistry: Ferromagnetic and Anti-ferromagnetic,
Week 14	Magnetic momentum and EPR spin
Week 15	Orbital and spin role of magnetic momentum, ESR
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Purification of table salt
Week 2	Purification of table salt
Week 3	Find the percentage of water in a hydrolyzed compound

Week 4	Find the percentage of water in a hydrolyzed compound
Week 5	Determine the concentration of hydrogen peroxide in the solution
Week 6	Determine the concentration of hydrogen peroxide in the solution
Week 7	Preparation of potash alum
Week 8	Preparation of potash alum
Week 9	Detection of alum ions
Week 10	Detection of alum ions
Week 11	Calculation of the percentage of crystallization water in potash alum
Week 12	Calculation of the percentage of crystallization water in potash alum
Week 13	Preparation of barium peroxide
Week 14	Preparation of barium peroxide
Week 15	Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	**1- Inorganic chemistry, principles of structure and reactivity,2nd ed., James E. Huheey, 1983** **2-Inorganic chemistry, 3rd ed., Housecroft C.E. and**	Yes
Recommended Texts		No
Websites	ttp://rapidshare.de/files/20322418/Patnaik_P._-_Handbook_of_inorganic_chemicals__McGraw_Hill_2003_.rar	

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Thermodynamic Chemistry I**			**Module Delivery**	
Module Type	**Core**			☒ **Theory**	
Module Code	**Che-23115**			☒ **Lecture**	
ECTS Credits	**6**			☒ **Lab**	
SWL (hr/sem)	**150**			☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Level	2		**Semester of Delivery**	3	
Administering Department	Chem		**College**	CoS	
Module Leader	Ahmed Najem Abd		**e-mail**	dr.ahmednajemabd@uodiyala.edu.iq	
Module Leader's Acad. Title	Professor		**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 chemical reactions of gases and thermochemistry, and know how to solve problems related to them. Clarification of the energies of the bonds of organic interactions and knowledge of the first, second and third laws in thermodynamics And its practical applications aimed at developing and keeping pace with the scientific development of physical chemistry. Teaching and educating students on all the necessary and necessary information related to physical chemistry, which It qualifies them to work and research in all areas of physical chemistry
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Enable students to obtain knowledge and understanding of physical chemistry Enable students to obtain knowledge and understanding of gas reactions Enable students to obtain knowledge and understanding of the first, second and third laws of thermodynamics Enable students to obtain knowledge and understanding of examples and problems of physical chemistry.
Indicative Contents المحتويات الإرشادية	physical chemistry, gas reactions , laws of thermodynamics , Volume, pressure , work , first –law of thermodynamic , enthalpy cycle , heat capacity , joule –thomson effect , second laws of thermodynamics

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 physical chemistry. -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 practical problems..

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
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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
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	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	The gases
Week 2	The system and The energy
Week 3	Reversible and irreversible processe
Week 4	Volume, pressure , work
Week 5	The first –law of thermodynamic
Week 6	Enthalpy
Week 7	Enthalpy cycle
Week 8	**Midterm Exam**
Week 9	Standard enthalpy change of formation
Week 10	Heat capacity
Week 11	The joule experimental
Week 12	The joule –thomson effect
Week 13	The relationship between Cv and Cp
Week 14	The second laws of thermodynamics

Week 15	**Final exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Set the burette spill constant
Week 2	Determine the molecular weight using the Dumas method.
Week 3	Determination of the molecular weight by the freezing point method of a non-volatile solid
Week 4	Determine the solubility of sodium sulfate in water and find the transition point
Week 5	Determine the solubility of benzoic acid in water at different temperatures and calculate the heat of the solution
Week 6	Solubility as a function of temperature
Week 7	Find the mutual solubility between phenol and water
Week 8	Part A: Thermochemistry/ Determination of calorimetric constant. Part B: Heat of neutralization/ Determination of heat of neutralization of a strong acid with a strong base. Part C: Heat of solution/ Determination of the heat of a solution.
Week 9	Equilibrium Constant/ Determination the formula of a complex formed between Copper (II) ion and Ammonia.
Week 10	Properties of dilute solutions/ Distribution of a solute between immiscible solvents.
Week 11	Relative molecular mass/ Determine the relative molecular mass of a polymer from viscosity measurements.
Week 12	Three components liquid system/ The Triple system.
Week 13	Adsorption from solution.
Week 14	Revision for all Experiment to prepare for the final exam+ Repetition for some experiments which some student have missed throughout the course.
Week 15	**Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Phy.chem.gases and thermodynamics ,A.F.Dawood Al-Niaimi	Yes
Recommended Texts	1-PHy.chem. water J.Moor 2--Phy.chem. Danials 3-Atkins 4-Phy.chem. J.Barroue 4-Element of chemical thermodynamic L.K.Nash 5-Thermodynamics for chemistry	No
Websites	www.byPhysical Chemistry Books Adwww.scienceforums.com/forum/chemistr toco.com	

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