

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Physical Chemistry II		Module Delivery
Module Type	Basic learning activities		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	BCE124		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	1	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Dr. Hassan H. Al-Mohammedawi	e-mail	hasan.h@kechbu.uobaghdad.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Noor Ehsan	e-mail	noor.e@kechbu.uobaghdad.edu.iq
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date		Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	BCE115	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p>Module Objectives أهداف المادة الدراسية</p>	<p>The aim of this module is to develop the students' knowledge of the physical chemistry. In this module, students will the study of the underlying physical principles that govern the properties and behavior of chemical systems to use these principles to design separation equipment such as fractional distillation.</p> <p>Thus, this course deals with the following main topics: Second law of thermodynamics and Chemical equilibrium</p>
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<p>After studying this course the students will be able to:</p> <ol style="list-style-type: none"> 1) Apply knowledge of physical chemistry to predict the equilibrium composition of reaction mixtures. 2) Calculate entropy and Gibbs energy 3) Design different equipment used in biochemical engineering. 4) Recognize difference between the first law of thermodynamics and the second law of thermodynamics. 5) Work as a team and provide them with a powerful tool for developing practical skills. 6) Help students to build confidence in their abilities.
<p>Indicative Contents المحتويات الإرشادية</p>	<p>Part A- Second law of thermodynamics, entropy, the Gibbs energy [30 hrs.]</p> <p>Part B- Chemical equilibrium, the equilibrium constant [30 hrs.]</p> <p>Part C- Electrochemistry [18 hrs.]</p>

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

<p>Strategies</p>	<p>The basic strategies that will be applied to help students learn and understand this module are Cooperative Learning and Active Learning strategies. Using cooperative learning encourages students to work together in small groups to achieve a common goal. It promotes teamwork and communication. In addition, using active learning helps students to participate in the learning process through activities such as discussions.</p>
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Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	47	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	1hr/ 4	10% (10)	2,5,8 and 11	LO #1, #2 , #3and #4
	Assignments	1hr/ 2	5% (5)	3 and 9	LO #1, #4
	Projects / Lab.	1	8% (8)	Continuous	All
	Report	7	7% (7)	2,4,5,7,8,10,11 and 13	LO #4 , #5
Summative assessment	Midterm Exam	2hr/3	20% (20)	5,10,14	LO #1 - #4
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Second law of thermodynamics, entropy
Week 2	Entropy, Reversibility, and Irreversibility
Week 3	Examples
Week 4	The standard reaction entropy
Week 5	Gibbs energy, Gibbs energies of formation
Week 6	Examples
Week 7	Chemical equilibrium, Equilibrium constant
Week 8	The relation between equilibrium constants
Week 9	Examples
Week 10	Exergonic and endergonic reactions
Week 11	Reaction Gibbs energy
Week 12	Examples
Week 13	Electrochemistry, redox reaction
Week 14	The Thermodynamics of Electrochemical Cells
Week 15	Examples
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Accuracy and precision of the density of liquid measurements
Week 2	Lab 2: Viscosity of liquids by a falling ball viscometer
Week 3	Lab 3: Effect of concentration on reaction rate
Week 4	Lab 4: Effect of temperature on reaction rate
Week 5	Lab 5: Enthalpy of neutralization
Week 6	Lab 6: Heat of solution
Week 7	Lab 7: Adsorption

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	<ul style="list-style-type: none"> ▪ Alberty, R. A., Robert J.S. and Mounji G. B., (2004). Physical Chemistry. 4th ed, John Wiley and Sons. ▪ Atkins, P. and De Paula, J., 2018. Physical Chemistry. Oxford: Oxford University Press. 	Yes
Recommended Texts	<ul style="list-style-type: none"> ▪ Levine, I., 2009. Physical Chemistry. Boston: McGraw-Hill. 	Yes
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.