

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Chemistry		Module Delivery
Module Type	Basic		☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	CREQ180		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	1	Semester of Delivery	
Administering Department		College	BENG
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date		Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	Semester	
Co-requisites module	Physiology	Semester	1 and 2 in 3 rd year

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	Course is designed to learn the student 7 main principles: 1- Philosophy of chemistry in medicine & biomedical engineering. 2- To apply this philosophy in work field. 3- To get a practical skill. 4-To develop problem solving skills and developing professional capabilities 5- To deals with the basic concept of clinical biochemistry and related devices and instrument 6. To interpretation the chemical pathways among main molecules in human body (carbohydrate, protein, lipids)and understanding its methods measurements
--	--

ALAYEN IRAQI
UNIVERSITY
AUIQ

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The student will be able : 1. To understands the concept of occupational safety, especially when working in hospitals and medical laboratories, through his understanding of warning signs and methods of prevention from the dangers resulting from the use of chemicals. 2. To learn about glassware and laboratory equipment and how to deal with them 3. Clarification and measurement of some properties of chemicals such as boiling and melting points and other properties 4. To learn how to prepare, measure and calculate standard solutions, and determine concentration by titration. 5. To learn basic concepts of separation, chemical subjects and some technical methods related with biomedical engineering. 6. Learn about the concept of acidity and alkalinity, the method of measuring them, and Buffer molecules and systems (blood, lungs, and kidneys) in the human body. 7. Recognizing the role of some types of chemistry, such as nuclear chemistry, in treatment and diagnosis. 8. Knowing the applications of pressure laws and their impact on the chemo physiological processes in the human body, such as breathing processes (inhalation and exhalation). 9. Learn the steps to achieve balance for the organism, especially the human being, and how to maintain the homeostasis of human body. 10. To know about human blood and its component and understand about
	separation serum or plasma from hole blood. 11. To recognize the main chemical molecule (carbohydrate, proteins and lipids) in human body and the relationship among them to understand normal and abnormal cases that related to metabolism. 12. To recognize other important chemical molecule(Hormones, enzymes, vitamins and minerals), and clarify its role in the body and its impact on the various vital processes in the human body

Indicative Contents	Indicative content includes the following:- <u>Part A – General chemistry</u> Solutions, solution terminology (solubility, factor influencing solubility, saturated solutions, unsaturated solutions, supersaturated solutions) [4 hrs.] , dilutions, isotonic solutions, aqueous solutions, ionic solutions, electrolytes and non-electrolytes. [5 hrs.] osmosis and osmotic pressure, colloids, emulsifying agents dialysis and living systems [4 hrs.] Acids& Bases, measuring pH, acid- base titration, buffer solutions, blood buffers and buffering capacity in blood. [4 hrs.] Nuclear chemistry , Isotopes, Radioactivity, type of radiation, properties of Alpha, Beta and Gamma radiation, Ionizing radiation, Units, detection devices, physiological effects of radiation, radioactive decay series, nuclear reactions, half – life, uses of radioisotopes(especially in medicine). [4 hrs.] Gases, Ideal gas laws, Boyle’s low, Charle’s low , Gay- Lussac’s low, The combined gas low, and Dalton’s low, Gas low and breathing, the combined gas low, and Dalton’s low, Gas low and breathing [4 hrs.] <u>Part B – Biochemistry</u> Introduction, metabolism (anabolism and catabolism), homeostasis, [4 hrs.] Blood [4 hrs.]. Carbohydrates (definitions, functional group, characteristics, reactions) [8 hrs.] Proteins (definitions, functional group, characteristics, reactions) [4 hrs.] Lipid (definitions, functional group, characteristics, reactions). [2 hrs.] Lipid profile, Body mass index (BMI). [4 hrs.] Interpretation of metabolism (pathways of metabolism, disease due to error in metabolism) [12 hrs.] Hormones, enzymes, vitamins and minerals. [12 hrs.]
-----------------------------------	---

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Assessment is based on hand-in assignments, written exam, Case study, Quizzes, seminars, Practical testing and Online testing.
-------------------	--

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	94	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	31	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	2.06
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	5	15% (15)	2,5,6, 11,12	LO #1,2,4,6,7,8 10 and 11
	Assignments	0	0	-	-
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	15% (15)	13	LO # 1, 2,3,4,5 and 11
Summative assessment	Midterm Exam	3hr	10% (10)	7	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	Solutions, solution terminology (solubility, factor influencing solubility, saturated solutions, unsaturated solutions, supersaturated solutions)
Week 2	Dilutions, isotonic solutions, aqueous solutions, ionic solutions, electrolytes and non-electrolytes.
Week 3	Osmosis and osmotic pressure, colloids, emulsifying agents dialysis and living systems
Week 4	Acids& Bases, measuring pH, acid- base titration, buffer solutions, blood buffers and buffering capacity in blood.
Week 5	Nuclear chemistry , Isotopes, Radioactivity, type of radiation, properties of Alpha, Beta and Gamma radiation, Ionizing radiation, Units, detection devices, physiological effects of radiation, radioactive decay series, nuclear reactions, half – life, uses of radioisotopes(especially in medicine).
Week 6	Gases, Ideal gas laws, Boyle, s low, Charle,s low , Gay- Lussac, s low, The combined gas low, and Dalton,s low, Gas low and breathing, the combined gas low, and Dalton, s low, Gas low and breathing
Week 7	Introduction, metabolism (anabolism and catabolism), homeostasis.
Week 8	Blood
Week 9	Carbohydrates (definitions, functional group, characteristics, reactions).
Week 10	Proteins (definitions, functional group, characteristics, reactions).
Week 11	Lipid (definitions, functional group, characteristics, reactions). Lipid profile, Body mass index (BMI).

Week 12	Interpretation of metabolism (pathways of metabolism, disease due to error in metabolism) PART I
Week 13	Interpretation of metabolism (pathways of metabolism, disease due to error in metabolism) PART II
Week 14	Hormones
Week 15	Enzymes,
Week 16	Vitamins and minerals.

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: introduction , chemical glassware, Laboratory safety practices
Week 2	Lab 2: Melting and Boiling point
Week 3	Lab 3: prepare standard solution
Week 4	Lab 4: Determine the exact concentration of HCl solution (by titration)
Week 5	Lab 5: Identify an unknown chemical mixture
Week 6	Lab 6: Simple or fractional distillation
Week 7	Lab 7: Identify and distinguish carbohydrate
Week 8	Lab 7: Identify and distinguish protein
Week 9	Lab 7: Identify and distinguish lipid + measuring body mass index (BMI)
Week 10	Lab 8: separation of human blood and measure the level of plasma glucose in blood

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts		
Recommended Texts		
Websites		

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جدا جيد	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.