Ministry of Higher Education and Scientific Research

Scientific Ssupervision and Evaluation device

Department of Quality Assurance and Academic Accreditation

International Accreditation Department

Academic Program Description For the Department of Chemistry for the Academic year 2025-2024

Academic Program Description Form

University Name: University of Babylon

College/Institute: College of Science for Women

Name of the academic or professional program: Bachelor's in Chemistry

Name of final degree: Bachelor's in Chemistry

Study system: semester + Bologna track

Description preparation date: 20/11/2024

Date of filling out the file: 19/2/2025

Signature: 

Signatur 

Name of Department Head

Hazim Yahya Mohammed Ali

Date: 6 / 3 / 2025

Name of Scientific Assistant

Abeer Fauzi Murad

Date: 6 / 3 / 2025

The file is checked by

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Mohammed J.Jader

Date: 6 / 3 / 2025

Signature: 

Approval of the Dean

Academic Program Description

1. Program Vision

Preparing a scientific and technical staff specialized in chemical analysis techniques with the ability to deal with all techniques in chemical analysis with high professionalism, including analyzes concerned with treating pollution from heavy chemical substances and elements such as lead and mercury that affect the lives of citizens. The department also contributes to the scientific research movement and introductory, developmental and advisory conferences. The unified curricula have been adopted with most Iraqi universities - the Department of Chemistry for the purpose of easy movement between departments in addition to scientific benefit from them, taking into account the requirements of the college as a scientific college.

2. Program Mission

In order to achieve the vision of the College of Science for Girls and to carry out its pioneering role in assuming a prominent scientific position among local, Arab and foreign colleges, the Department of Chemistry seeks to disseminate and consolidate the latest information about chemistry in Iraqi society to keep pace with the tremendous development that has been achieved during the last three decades in this field and at all levels of Nanotechnology and even outer space.

The Department of Chemistry at the College of Science for Girls seeks, in integration with the college's mission, to meet the community's needs for cadres specialized in chemistry, such as pathological analyzes and the use of modern techniques in the field of analysis of toxic and non-toxic elements in all scientific and practical applications, especially in the medical and industrial fields, and the preparation of cadres required by this. Specialized research to work in this field and keep up with the latest developments in it.

3. Program Objectives

.1Preparing efficient cadres in the field of chemistry sciences

.2 Contribute to the development of cadres working in the field of chemical sciences in various sectors such as the manufacture of fertilizers, oils and dairy.

.3 Developing the work system in the field of chemistry

.4 Spreading scientific awareness in the field of chemistry

5. Calculation of work in the industrial field related to chemistry according to the ISO standard

4. Programmatic Accreditation

nothing

5. Other External Influences

nothing

6. Program Structure

Program Structure	*Number of courses*		*Credit hours*		*Percentage*	*Reviews*
Enterprise Requirements	The first stage,Course (1), according to the Bologna system	2	The first stage,Course (1), according to the Bologna system	4	%13.3	Basic
	The first stage,Course (2), according to the Bologna system	2	The first stage,Course (2), according to the Bologna system	5	%16.6	
	Second stage Course (1)	2	Second stage Course (1)	3	%14.2	

	Second stage Course (2)	2	Second stage Course (2)	3	%14.2	
	The third stage Course (1)	-	The third stage Course (1)	-	-	
	The third stage Course (2)	1	The third stage Course (2)	2	%11.1	
	Fourth stage Course (1)	-	Fourth stage Course (1)	-	-	
	Fourth stage Course (2)	1	Fourth stage Course (2)	2	%11.7	
Total summation		10		19		
College Requirements	The first stage,Course (1), according to the Bologna system	1	The first stage,Course (1), according to the Bologna system	5	%16.6	Basic
	The first stage,Course (2), according to the Bologna system	1	The first stage,Course (2), according to the Bologna system	4	%13.3	
Total summation		2		9		
Department Requirements	The first stage,Course (1), according to the Bologna system	3	The first stage,Course (1), according to the Bologna system	21	%70	Basic
	The first stage,Course (2), according to the Bologna system	3	The first stage,Course (2), according to the Bologna system	21	%70	
	Second stage Course (1)	7	Second stage Course (1)	18	%85.7	

	Second stage Course (2)	7	Second stage Course (2)	18	%85.7	
	The third stage Course (1)	7	The third stage Course (1)	19	%100	
	The third stage Course (2)	6	The third stage Course (2)	16	%88.8	
	Fourth stage Course (1)	8	Fourth stage Course (1)	15	%100	
	Fourth stage Course (2)	7	Fourth stage Course (2)	15	%88.2	
Total summation		48		143		
Summer Training	1		-			Basic

7. Program Description

Year/level	course code	Name of the course	Credit hours	
			Theoretical	Practical

Republic of Iraq - Ministry of Higher Education and Scientific Research

University of Babylon

Bachelor's degree in chemistry science (First cycle)

Four years (Eight semesters) - 240 ECTS credits - 1 ECTS = 25 hr

Program Curriculum (2024 - 2025)

جمهورية العراق - وزارة التعليم العالي والبحث العلمي

جامعة بابل

بكالوريوس في علوم الكيمياء (الدورة الأولى)

أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة اوربية . كل وحدة اوربية = ٢٥ ساعة

المنهاج الدراسي للعام ٢٠٢٤-٢٠٢٥

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w) CL (hr/w	ect (hr/w	ab (hr/w	Pr (hr/w	Tut (hr/w	emn (hr/w	Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
UGI	One	1	CHEM1111	Qualitative Analysis Chemistry	كيمياء التحليل النوعي	English	2	0	2	0	0	0	3	63	137	200	8.00	C	
		2	CHEM1112	Inorganic1	اللاعضوية ١	English	2	0	0	0	0	0	3	33	142	175	7.00	C	
		3	CHEM1103	Cytology	علم الخليه	English	2	0	2	0	0	0	3	63	87	150	6.00	S	
		4	CHEM1104	Labortary Safty	السلامة والامن الكيمياي	English	2	0	0	0	0	0	3	33	92	125	5.00	S	
		5	UOBAB1104	Human and Democracy	حقوق الانسان والديمقراطيه	Arabic	2	0	0	0	0	0	3	33	17	50	2.00	B	
		6	UOBAB1102	Arabic Language	اللغة العربيه	Arabic	2	0	0	0	0	0	3	33	17	50	2.00	B	
						Total	12	0	4	0	0	0	18	258	492	750	30.00		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w) CL (hr/w	ect (hr/w	ab (hr/w	Pr (hr/w	Tut (hr/w	emn (hr/w	Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
	Two	1	CHEM1201	Volumetric Analysis Chemistry	كيمياء التحليل الحجمي	English	2	0	2	0	0	0	3	63	137	200	8.00	C	CHEM1111
		2	CHEM1202	Inorganic 2	اللاعضوية ٢	English	2	0	0	0	0	0	3	33	142	175	7.00	C	CHEM1112
		3	CHEM1203	Mathematics I	رياضيات I	English	2	0	0	0	0	0	3	33	67	100	4.00	S	
		4	CHEM1204	Physics Science	الفيزياء	English	2	0	2	0	0	0	3	63	87	150	6.00	S	
		5	UOBABb4	Computer I	حاسوب I	Arabic	2	0	0	0	0	0	3	33	42	75	3.00	B	
		6	UOBABb1101	English Language I	لغة الانكليزية I	English	2	0	0	0	0	0	3	33	17	50	2.00	B	
						Total	12	0	4	0	0	0	18	258	492	750	30.00		

Republic of Iraq - Ministry of Higher Education and Scientific Research

University of Babylon

Bachelor's degree in chemistry science (First cycle)

Four years (Eight semesters) - 240 ECTS credits - 1 ECTS = 25 hr

Program Curriculum (2024 - 2025)

جمهورية العراق - وزارة التعليم العالي والبحث العلمي

جامعة بابل

بكالوريوس في علوم الكيمياء (الدورة الأولى)

أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة اوربية . كل وحدة اوربية = ٢٥ ساعة

المنهاج الدراسي للعام ٢٠٢٤-٢٠٢٥

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w) CL (hr/w	Lect (hr/w	Lab (hr/w	Pr (hr/w	Tut (hr/w	Semn (hr/w	Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
UGI	One	1	CHEM2311	Chemistry of represented elements 1	كيمياء العناصر الممثلة١	English	2	0	2	0	0	0	3	63	87	150	6.00	C	
		2	CHEM2302	Gravimetric analysis	التحليل الوزني	English	2	0	2	0	0	0	3	63	87	150	6.00	C	
		3	CHEM2313	Thermodynamics1	الديناميه الحراريه١	English	2	0	2	0	0	0	3	63	87	150	6.00	C	
		4	CHEM2314	Organic Chemistry1	الكيمياء العضوية١	English	2	0	2	0	0	0	3	63	87	150	6.00	C	
		5	CHEM2305	Differential equations	المعادلات التفاضلية	English	2	0	0	0	0	0	3	33	42	75	3.00	S	
		6		Computer 2	الحاسوب ٢	English	2	0	0	0	0	0	3	33	42	75	3.00	S	
						Total	12	0	8	0	0	0	18	318	432	750	30.00		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w) CL (hr/w	ect (hr/w	ab (hr/w	Pr (hr/w	Tut (hr/w	emn (hr/w	Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
	Two	1	CHEM2401	Chemistry of represented elements 2	كيمياء العناصر الممثلة ٢	English	2	0	2	0	0	0	3	63	87	150	6.00	C	CHEM2311
		2	CHEM2402	Separation Methods	طرق الفصل	English	2	0	2	0	0	0	3	63	87	150	6.00	C	
		3	CHEM2403	Thermodynamics 2	الديناميه الحراريه ٢	English	2	0	2	0	0	0	3	63	87	150	6.00	C	CHEM2313
		4	CHEM2404	Organic Chemistry 2	الكيمياء العضوية ٢	English	2	0	2	0	0	0	3	63	87	150	6.00	C	CHEM2314
		5	UOBAB2301	Baath Party crimes	جرائم البعث البائد	Arabic	2	0	0	0	0	0	3	33	17	50	2.00	S	
			UOBAB2302	English Languagell	اللغة الانكليزيه II	English	2	0	0	0	0	0	3	33	17	50	2.00	S	
			UOBAB1102	Arabic Language	اللغة العربيه	Arabic	2	0	0	0	0	0	3	33	17	50	2.00	B	
						Total	12	0	8	0	0	0	18	318	432	750	30.00		

المواد الدراسية وعدد الوحدات للمرحلة الثالثة لقسم الكيمياء – كلية العلوم للبنات – جامعة بابل للعام الدراسي 2024 – 2025

المرحلة الثالثة- الفصل الاول

اسم المادة باللغة العربية	اسم المادة باللغة الانكليزية	الساعات الاسبوعية		عدد الوحدات
		نظري	عملي	
الكيمياء الفيزياوية-1	Physical Chemistry-1	2	2	3
الكيمياء العضوية-1	Organic Chemistry-1	2	2	3
الكيمياء اللاعضوية-1	Inorganic Chemistry-1	2	2	3
الكيمياء الحياتية- 1	Biochemistry-1	2	2	3
الكيمياء الصناعية-1	Industrial Chemistry-1	2	-	2
البيئة	Environmental	2	-	2
اللغة الانكليزية-3	English Language-3	2	-	2

المرحلة الثالثة /الفصل الثاني

اسم المادة باللغة العربية	اسم المادة باللغة الانكليزية	الساعات الاسبوعية		عدد الوحدات
		نظري	عملي	
الكيمياء الفيزياوية-2	Physical Chemistry-2	2	2	3
الكيمياء العضوية-2	Organic Chemistry-2	2	2	3
الكيمياء اللاعضوية-2	Inorganic Chemistry-2	2	2	3
الكيمياء الحياتية- 2	Biochemistry-2	2	2	3
الكيمياء الصناعية-2	Industrial Chemistry-2	2	-	2
تانوتكنولوجي	Nanotechnology	2	-	2

المواد الدراسية وعدد الوحدات للمرحلة الرابعة لقسم الكيمياء– كلية العلوم للبنات – جامعة بابل للعام الدراسي 2024 – 2025				
المرحلة الرابعة- الفصل الاول				
اسم الماده باللغه العربيه	اسم الماده باللغه الانكليزية	الساعات الاسبوعيه		عدد الوحدات
		نظري	عملي	
التحليل الالي-1	Instrumental analysis -1	2	2	3
كيمياء الكم	Quantum Chemistry	2	-	2
الكيمياء الصناعيه-1	Industrial Chemistry-1	2	2	3
الكيمياء الحياتيه السريرية- 1	Bio clinical chemistry-1	2	2	3
حلقية غير متجانسة	Heterocyclic	2	-	2
اللغة الانكليزية-4	English Language-4	2	-	2
مشروع بحث	Research project	2	-	2
المرحلة الرابعة /الفصل الثاني				
اسم الماده باللغه العربيه	اسم الماده باللغه الانكليزية	الساعات الاسبوعيه		عدد الوحدات
		نظري	عملي	
التحليل الالي-2	Instrumental analysis -2	2	2	3
الاطياف	Spectroscopy	2	-	2
الكيمياء الصناعيه-2	Industrial Chemistry-2	2	2	3
الكيمياء الحياتيه السريرية- 2	Bio clinical chemistry-2	2	2	3
كيمياء الضوء	Photochemistry	2	-	2
كيمياء التشخيص العضوي	Identification of organic chemistry	2	6	4

8.The expected learning outcomes of the program	
Knowledge	
Knowledge and Understanding	1- 1. The student gets to know the concept of chemistry 2- 2. To classify the needs for developing chemistry 3- 3. To separate the chemical specifications according to the ISO system 4- 4. To evaluate the cost of maintaining chemical manufacturing equipment
Skills	
Subject-Specific Skills	.1The student's knowledge of the concept of chemistry .2The importance of chemistry in areas of life 3. Enabling female students to analyze the costs of working in the chemical industry
Thinking Skills	.1Thinking skill according to the student's ability (the goal of this skill is for the student to believe in what is tangible (the student's abilities) and understand when, what and how he should think and work to improve the ability to think reasonably(.2 High thinking skill (the goal of this skill is to teach thinking well before making the decision that determines the student's life(3. Critical thinking skills (a term that symbolizes the highest levels of thinking, which aims to pose a problem and then analyze it
Ethics	

Evaluation methods	1- Exams 2- Learning Matrix 3- Which Face 4- CAT (student feedback) 5- Learning Triangle

9. Teaching and Learning Strategies

Learning strategies

1-Thinking strategy according to the student's ability (for example: if the student is able to learn the correct concept of management, he will acquire the skill of managing and organizing his personal life).

2- High thinking skill strategy (for example, if the student wants to make a good decision, it is important that he thinks well before he makes the decision, and if he decides without thinking, or if he cannot think well, or if he cannot decide, or perhaps he will not decide, then this This means he does not have high thinking skills.)

3- Critical thinking strategy in learning (Critical Thanking) (It is a term that symbolizes the highest levels of thinking, which aims to pose a problem and then analyze it logically to reach the desired solution).

4-Brainstorming

Methods of teaching and learning

1- Method of giving lectures.

2- Student Center

3- Student groups

4- Workshops

5- (Scientific trips to follow up on the environmental reality)

6- Learning Technologies on Campus

7- (Experiential learning)

8- Application Learning)

10. Evaluation methods

1- Exams

2- Learning Matrix

3- Which Face

4- CAT (student feedback)

5- Learning Triangle

11. Faculty

Faculty Members

Academic Rank	*Instructor's name*	*Specialization*		*Special Requirements/skills (it applicable)*	*Number of the teaching staff*	
		General	*Special*		*staff*	*lecturer*
Professor	Dr. Hazim Yahya Mohammed Ali	Chemistry	Physical Chemistry		√	
Professor	Dr.Ayad Fahdil Mohammed	Chemistry	Physical Chemistry		√	
Professor	Dr. Mohmmed Hamid Saaid	Chemistry	Inorganic Chemistry		√	
Professor	Dr. Talat Tariq Kahlil	Chemistry	Bio Chemistry		√	
Professor	Dr. Sadiq Abed Al hussain	Chemistry	Organic Chemistry/Polymer		√	
Professor	Dr.Fuad Fahdil Mohammed	Chemistry	Analytical Chemistry		√	
Professor	Dr. Assyl Moshtaq Kahdim	Chemistry	Analytical Chemistry		√	
Assistant Professor	Dr. Noor Abed Al razaq	Chemistry	Organic Chemistry		√	
Assistant Professor	Dr. Suad Taha Saad	Chemistry	Inorganic Chemistry		√	
Assistant Professor	Dr. Ahmed Hassan Shintaf	Chemistry	Organic Chemistry		√	
Assistant Professor	Dr. Ali Talib Bader	Chemistry	Inorganic Chemistry		√	
Assistant Professor	Dr. Zainab Hashim Khudaier	Chemistry	Analytical Chemistry		√	
Assistant Professor	Dr. Ziyad Omran Musaa	Chemistry	Organic Chemistry		√	

Teacher	Mohammed Edan Hassan	Chemistry	Analytical Chemistry		√	
Teacher	Ali Mohsum Mohammed	Chemistry	Physical Chemistry		√	
teacher	Shiren Hamza Abbas	Chemistry	Bio Chemistry		√	
assistant teacher	Rana Salah Norri	Chemistry	Bio Chemistry		√	

Professional Development

Mentoring new faculty members

Teaching, like any other art, can be acquired by practicing and following its methods and principles, provided that there is a sincere desire to practice the teaching profession, and the method in education means taking interconnected steps to reach a specific goal that you hope to achieve. Therefore, it must follow the basic principles of good teaching, which are:

1- Directing and guiding learners by creating educational situations that lead to desirable activities.

2- Providing an atmosphere of love, kindness and cooperation between the teacher and the learners and between the learners themselves through his love for his students without discrimination and not excessive feminization.

3- Adopting democratic leadership through the emotional relationship between the teacher and his students, which leads them to control based on mutual respect and creating a cooperative atmosphere between the students and between the teacher and his students.

Professional development for faculty members

1- Thinking strategy according to the student's ability (for example: if the student is able to learn the correct concept of management, he will acquire the skill of managing and organizing his personal life). And the high thinking skill strategy (for example, if the student wants to make a good decision, it is important that he thinks well before he makes the decision, and if he decides without thinking or if he cannot think well or if he cannot decide or perhaps he will not decide, this means He does not have high thinking skills.)

2- General and transferable skills (other skills related to employability and personal development).

3- Verbal communication.

4- Teamwork.

5- Analysis and investigation (collecting information systematically and scientifically to establish facts and principles for solving the problem).

12. Acceptance criterion

Central acceptance and parallel acceptance

13. The most important sources of information about the program

1- The website of the college and university.

https://csg.uobabylon.edu.iq/
https://csg.uobabylon.edu.iq/department/?cdid=4

https://csg.uobabylon.edu.iq/department/dep_lectures.aspx?cdid=4

2- University guide .https://systems.uobabylon.edu.iq /

3- The most important books and resources in the college library.

14. Program development plan

The Bologna Process was applied to the students of the first stage, and work is being done to apply it to the next stages, along with conducting workshops and seminars to familiarize faculty members with the requirements of the Bologna Process and how to work with it, and to discuss the negatives and obstacles and find solutions for them. The electronic system was applied in the education process.

Program skills Outline																			
				Required program learning outcomes															
Year/Level	*Course Code*	*Course Name*	*Basic or optional*	*Knowledge*				*Skills*				*Ethics*				*Other skills related to employability and personal development*			
				A_1	A_2	A_3	A_4	B_1	B_2	B_3	B_4	C_1	C_2	C_3	C_4	D_1	D_2	D_3	D_4
The first stage, Course (1), according to the Bologna system		Qualitative Analytical chem.	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		Inorganic -1	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		Cytology	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		Laboratory safety	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		Human and Democracy	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		Arabic Language	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Program skills Outline																			
				Required program learning outcomes															
Year/Level	*Course Code*	*Course Name*	*Basic or optional*	*Knowledge*				*Skills*				*Ethics*				*Other skills related to employability and personal development*			
				A_1	A_2	A_3	A_4	B_1	B_2	B_3	B_4	C_1	C_2	C_3	C_4	D_1	D_2	D_3	D_4
The first stage, Course (2), according to the Bologna system		**Volumetric Analytical chem.**	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		Inorganic -2	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		Mathematics	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		Physics Sciences	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		Computers Program	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		English Language	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Program skills Outline																			
				Required program learning outcomes															
Year/Level	***Course Code***	***Course Name***	***Basic or optional***	***Knowledge***				***Skills***				***Ethics***				***Other skills related to employability and personal development***			
				A_1	A_2	A_3	A_4	B_1	B_2	B_3	B_4	C_1	C_2	C_3	C_4	D_1	D_2	D_3	D_4
Second stage Course (1)	Sg Lph Gopt 201401 (2,2)	Chemistry of representative elements 1	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		Gravimetric analysis	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		Thermodynamics -1	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		Organic Chemistry-1	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		Differential Equations	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

		Computer sciences-2	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		Baath Partycrimes	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
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Program skills Outline

				Required program learning outcomes															
Year /Level	***Course Code***	***Course Name***	***Basic or optional***	***Knowledge***				***Skills***				***Ethics***				***Other skills related to employability and personal development***			
				A_1	A_2	A_3	A_4	B_1	B_2	B_3	B_4	C_1	C_2	C_3	C_4	D_1	D_2	D_3	D_4
Second stage Course (2)		Chemistry of representative elements 2	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		Separation Methods	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
			Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		Thermodynamics 2	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		Organic Chemistry-2	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

		English Language-2	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Program skills Outline																			
				Required program learning outcomes															
Year /Level	***Course Code***	***Course Name***	***Basic or optional***	***Knowledge***				***Skills***				***Ethics***				***Other skills related to employability and personal development***			
				A_1	A_2	A_3	A_4	B_1	B_2	B_3	B_4	C_1	C_2	C_3	C_4	D_1	D_2	D_3	D_4
The third stage Course (1)		Physical Chemistry-1	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		Organic Chemistry-1	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		Inorganic Chemistry-1	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		Biochemistry-1	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		Industrial	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

		Chemistry-1																	
		Environmental	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		English Language-3	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Program skills Outline																			
				Required program learning outcomes															
Year /Level	***Course Code***	***Course Name***	***Basic or optional***	***Knowledge***				***Skills***				***Ethics***				***Other skills related to employability and personal development***			
				A_1	A_2	A_3	A_4	B_1	B_2	B_3	B_4	C_1	C_2	C_3	C_4	D_1	D_2	D_3	D_4
The third stage Course (2)		Physical Chemistry-2	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		Organic Chemistry-2	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		Inorganic Chemistry-2	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		Biochemistry-2	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		Industrial Chemistry-2	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		Nanotechnology	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Program skills Outline																			
				Required program learning outcomes															
Year /Level	***Course Code***	***Course Name***	***Basic or optional***	***Knowledge***				***Skills***				***Ethics***				***Other skills related to employability and personal development***			
				A_1	***A_2***	***A_3***	***A_4***	***B_1***	***B_2***	***B_3***	***B_4***	***C_1***	***C_2***	***C_3***	***C_4***	***D_1***	***D_2***	***D_3***	***D_4***
The fourth stage Course (1)		Instrumental analysis -1	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		Quantum Chemistry	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
			Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		Industrial Chemistry-1	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		Biochemistry-1	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		Heterocyclic	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		English Language-4																	

	ـــــ	Research Methodology																	

Program skills Outline																			
				Required program learning outcomes															
Year /Level	***Course Code***	***Course Name***	***Basic or optional***	***Knowledge***				***Skills***				***Ethics***				***Other skills related to employability and personal development***			
				A_1	A_2	A_3	A_4	B_1	B_2	B_3	B_4	C_1	C_2	C_3	C_4	D_1	D_2	D_3	D_4
The fourth stage Course (2)		Instrumental analysis -2	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		Spectroscopy	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		Industrial Chemistry-2	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		Biochemistry-2	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		Photochemistry	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		Identification of organic chemistry	Basic	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

وزارة التعليم العالي والبحث العلمي
جـــهاز الإشـــراف والتقـويم العلـمي
دائرة ضمان الجودة والاعتماد الأكاديمي
قسم الاعتماد الدولي

استمارة وصف البرنامج الأكاديمي لقسم الكيمياء للعام الدراسي

2024-2025

نـــــــــــــموذج وصف البرنامج الاكاديمي

اسم الجامعة : جامعة بابل

الكلية/ المعهد: كلية العلوم للبنات

اسم البرنامج الأكاديمي او المهني : بكالوريوس علوم الكيمياء

اسم الشهادة النهائية : بكالوريوس في الكيمياء

النظام الدراسي : فصلي + مسار بولونيا

تاريخ اعداد الوصف : 20/ 11/2024

تاريخ ملء الملف : 19/ 2/ 2025

التوقيع:

اسم رئيس قسم: أ.د. حازم يحيى محمد علي

التاريخ 6 / 3 / 2025

التوقيع:

اسم المعاون العلمي: أ. د. عبير فوزي مراد

التاريخ 6 / 3 / 2025

دقق الملف من قبل

شعبة ضمان الجودة والأداء الجامعي

اسم مدير شعبة ضمان الجودة والأداء الجامعي : م. د. محمد جواد جادر

التاريخ 6 / 3 / 2025

مصادقة السيد العميد

نـــــــــموذج وصف البرنامج الأكاديمي

1.رؤية البرنامج

أعداد كادر علمي وتقني متخصص بتقنيات التحليلات الكيميائيه مع القدره على التعامل وبمهنيه عاليه مع كافة التقنيات بالتحليلات الكيميائيه ومنها التحليلات المهتمه بمعالجه التلوث من المواد والعناصر الكيميائيه الثقيله كالرصاص والزئبق التي تؤثر بحياه المواطنين. كذلك مساهمة القسم بحركة البحوث العلمية و المؤتمرات التعريفية و التطويرية و الاستشارية. تم اعتماد المناهج الموحده مع اغلب جامعات العراق –قسم الكيمياء لغرض سهوله التنقل بين الجاوعات اضافه للاستفاده العلمية منها ، مع مراعاة متطلبات الكلية ككلية علمية .

2.رسالة البرنامج

تحقيقا لرؤيا كلية العلوم للبنات و للقيام بدورها الريادي لتبوء مكانة علمية مرموقة بين الكليات المحلية و العربية و الأجنبية يسعى قسم الكيمياء إلى نشر و ترسيخ أحدث المعلومات عن الكيمياء في المجتمع العراقي لمواكبة التطور الهائل الذي تحقق خلال العقود الثلاثة الأخيرة في هذا المضمار وعلى كافة الأصعدة من النانو تكنولوجي و حتى الفضاء الخارجي .

يسعى قسم الكيمياء في كلية العلوم للبنات ، وتكاملا" مع رسالة الكلية في تلبية حاجات المجتمع من الكوادر المختصه في الكيمياء كالتحليلات المرضية واستخدام التقنيات الحديثة في مجال تحليل العناصر السامه وغير السامه في كافة التطبيقات العلمية والعملية خاصة في المجال الطبي والصناعي وما تطلبه ذلك من تهيئة الكوادر البحثية المتخصصة للعمل في هذا المجال ولمواكبة اخر التطورات فيه .

3. اهداف البرنامج

1. إعداد كوادر كفؤة في مجال علوم الكيمياء
2. المساهمة في تطوير الكوادر العاملة في مجال علوم الكيمياء في القطاعات المختلفة كصناعة الاسمدة والزيوت والالبان .
3. تطوير منظومة العمل في مجال اختصاص الكيمياء
4. نشر الوعي العلمي في مجال الكيمياء
5. احتساب العمل في المجال الصناعي ذو العلاقة بالكيمياء بموجب مواصفة الايزو

4.الاعتماد البرامجي

لا يوجد

5.المؤثرات الخارجية الاخرى

لا يوجد

6.هيكلية البرنامج

هيكلية البرنامج	عدد المقررات		وحدة دراسية		النسبة مئوية	ملاحظات
متطلبات	***المرحلة الأولى Course (1) حسب نظام بولونيا***	2	***المرحلة الأولى Course (1) حسب نظام بولونيا***	4	%13.3	اساسي

المؤسسة	***Course المرحلة الأولى (2) حسب نظام بولونيا***	2	***Course المرحلة الأولى (2) حسب نظام بولونيا***	5	%16.6	
	Course المرحلة الثانية (1)	2	***Course المرحلة الثانية (1)***	3	%14.2	
	Course المرحلة الثانية (2)	2	***Course المرحلة الثانية (2)***	3	%14.2	
	Course المرحلة الثالثة (1)	-	***Course المرحلة الثالثة (1)***	-	-	
	Course المرحلة الثالثة (2)	1	***Course المرحلة الثالثة (2)***	2	%11.1	
	Course المرحلة الرابعة (1)	-	***Course المرحلة الرابعة (1)***	-	-	
	Course المرحلة الرابعة (2)	1	***Course المرحلة الرابعة (2)***	2	%11.7	
المجموع الكلي		10		19		
متطلبات الكلية	***Course المرحلة الأولى (1) حسب نظام بولونيا***	1	***Course المرحلة الأولى (1) حسب نظام بولونيا***	5	%16.6	اساسي
	Course المرحلة الأولى (2) حسب نظام بولونيا	1	***Course المرحلة الأولى (2) حسب نظام بولونيا***	4	%13.3	
المجموع الكلي		2		9		
متطلبات القسم	***Course المرحلة الأولى (1) حسب نظام بولونيا***	3	***Course المرحلة الأولى (1) حسب نظام بولونيا***	21	%70	اساسي
	Course المرحلة الأولى (2) حسب نظام بولونيا	3	***Course المرحلة الأولى (2) حسب نظام بولونيا***	21	%70	
	Course المرحلة الثانية (1)	7	***Course المرحلة الثانية (1)***	18	%85.7	

	المرحلة الثانية Course (2)	7	المرحلة الثانية Course (2)	18	%85.7	
	المرحلة الثالثة Course (1)	7	المرحلة الثالثة Course (1)	19	%100	
	المرحلة الثالثة Course (2)	6	المرحلة الثالثة Course (2)	16	%88.8	
	المرحلة الرابعة Course (1)	8	المرحلة الرابعة Course (1)	15	%100	
	المرحلة الرابعة Course (2)	7	المرحلة الرابعة Course (2)	15	%88.2	
المجموع الكلي		48		143		
التدريب الصيفي	1		/			اساسي

7.وصف البرنامج

السنة /المستوى	رمز المقرر او المساق	اسم المقرر او المساق	الساعات المعتمدة	
			نظري	عملي

Republic of Iraq - Ministry of Higher Education and Scientific Research

University of Babylon

Bachelor's degree in chemistry science (First cycle)

Four years (Eight semesters) - 240 ECTS credits - 1 ECTS = 25 hr

Program Curriculum (2024 - 2025)

جمهورية العراق - وزارة التعليم العالي والبحث العلمي

جامعة بابل

بكالوريوس في علوم الكيمياء (الدورة الأولى)

أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة اوربية - كل وحدة اوربية = ٢٥ ساعة

المنهاج الدراسي للعام ٢٠٢٤-٢٠٢٥

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w) CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)	Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
UGI	One	1	CHEM1111	Qualitative Analysis Chemistry	كيمياء التحليل النوعي	English	2	0	2	0	0	0	3	63	137	200	8.00	C	
		2	CHEM1112	Inorganic1	اللاعضوية ١	English	2	0	0	0	0	0	3	33	142	175	7.00	C	
		3	CHEM1103	Cytology	علم الخليه	English	2	0	2	0	0	0	3	63	87	150	6.00	S	
		4	CHEM1104	Labortary Safty	السلامة والامن الكيمياي	English	2	0	0	0	0	0	3	33	92	125	5.00	S	
		5	UOBAB1104	Human and Democracy	حقوق الانسان والديمقراطيه	Arabic	2	0	0	0	0	0	3	33	17	50	2.00	B	
		6	UOBAB1102	Arabic Language	اللغة العربيه	Arabic	2	0	0	0	0	0	3	33	17	50	2.00	B	
						Total	12	0	4	0	0	0	18	258	492	750	30.00		

UGI	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w) CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)	Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
	Two	1	CHEM1201	Volumetric Analysis Chemistry	كيمياء التحليل الحجمي	English	2	0	2	0	0	0	3	63	137	200	8.00	C	CHEM1111
		2	CHEM1202	Inorganic 2	اللاعضوية ٢	English	2	0	0	0	0	0	3	33	142	175	7.00	C	CHEM1112
		3	CHEM1203	Mathematics I	رياضيات I	English	2	0	0	0	0	0	3	33	67	100	4.00	S	
		4	CHEM1204	Physics Science	الفيزياء	English	2	0	2	0	0	0	3	63	87	150	6.00	S	
		5	UOBABb4	Computer I	حاسوب I	Arabic	2	0	0	0	0	0	3	33	42	75	3.00	B	
		6	UOBABb1101	English Language I	لغة الانكليزية I	English	2	0	0	0	0	0	3	33	17	50	2.00	B	
						Total	12	0	4	0	0	0	18	258	492	750	30.00		

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جامعة بابل

بكالوريوس في علوم الكيمياء (الدورة الأولى)

أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة اوربية - كل وحدة اوربية = ٢٥ ساعة

المنهاج الدراسي للعام ٢٠٢٤-٢٠٢٥

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w) CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)	Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
UGI	One	1	CHEM2311	Chemistry of represented elements 1	كيمياء العناصر الممثلة١	English	2	0	2	0	0	0	3	63	87	150	6.00	C	
		2	CHEM2302	Gravimetric analysis	التحليل الوزني	English	2	0	2	0	0	0	3	63	87	150	6.00	C	
		3	CHEM2313	Thermodynamics1	الديناميه الحراريه١	English	2	0	2	0	0	0	3	63	87	150	6.00	C	
		4	CHEM2314	Organic Chemistry1	الكيمياء العضوية١	English	2	0	2	0	0	0	3	63	87	150	6.00	C	
		5	CHEM2305	Differential equations	المعادلات التفاضلية	English	2	0	0	0	0	0	3	33	42	75	3.00	S	
		6		Computer 2	الحاسوب ٢	English	2	0	0	0	0	0	3	33	42	75	3.00	S	
						Total	12	0	8	0	0	0	18	318	432	750	30.00		

UGI	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w) CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)	Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
	Two	1	CHEM2401	Chemistry of represented elements 2	كيمياء العناصر الممثلة ٢	English	2	0	2	0	0	0	3	63	87	150	6.00	C	CHEM2311
		2	CHEM2402	Separation Methods	طرق الفصل	English	2	0	2	0	0	0	3	63	87	150	6.00	C	
		3	CHEM2403	Thermodynamics 2	الديناميه الحراريه ٢	English	2	0	2	0	0	0	3	63	87	150	6.00	C	CHEM2313
		4	CHEM2404	Organic Chemistry 2	الكيمياء العضوية ٢	English	2	0	2	0	0	0	3	63	87	150	6.00	C	CHEM2314
		5	UOBAB2301	Baath Party crimes	جرائم البعث البائد	Arabic	2	0	0	0	0	0	3	33	17	50	2.00	S	
			UOBAB2302	English Languagell	اللغة الانكليزيه II	English	2	0	0	0	0	0	3	33	17	50	2.00	S	
			UOBAB1102	Arabic Language	اللغة العربيه	Arabic	2	0	0	0	0	0	3	33	17	50	2.00	B	
						Total	12	0	8	0	0	0	18	318	432	750	30.00		

المواد الدراسية وعدد الوحدات للمرحلة الثالثة لقسم الكيمياء – كلية العلوم للبنات – جامعة بابل للعام الدراسي 2024 – 2025

المرحلة الثالثة- الفصل الاول

اسم المادة باللغة العربية	اسم المادة باللغة الانكليزية	الساعات الاسبوعية		عدد الوحدات
		نظري	عملي	
الكيمياء الفيزياوية-1	Physical Chemistry-1	2	2	3
الكيمياء العضوية-1	Organic Chemistry-1	2	2	3
الكيمياء اللاعضويه-1	Inorganic Chemistry-1	2	2	3
الكيمياء الحياتيه- 1	Biochemistry-1	2	2	3
الكيمياء الصناعيه-1	Industrial Chemistry-1	2	-	2
البيئه	Environmental	2	-	2
اللغة الانكليزية-3	English Language-3	2	-	2

المرحلة الثالثة /الفصل الثاني

اسم المادة باللغة العربية	اسم المادة باللغة الانكليزية	الساعات الاسبوعية		عدد الوحدات
		نظري	عملي	
الكيمياء الفيزياوية-2	Physical Chemistry-2	2	2	3
الكيمياء العضوية-2	Organic Chemistry-2	2	2	3
الكيمياء اللاعضويه-2	Inorganic Chemistry-2	2	2	3
الكيمياء الحياتيه- 2	Biochemistry-2	2	2	3
الكيمياء الصناعيه-2	Industrial Chemistry-2	2	-	2
نانوتكنولوجي	Nanotechnology	2	-	2

المواد الدراسية وعدد الوحدات للمرحلة الرابعة لقسم الكيمياء– كلية العلوم للبنات – جامعة بابل للعام الدراسي 2024 – 2025				
المرحلة الرابعة- الفصل الاول				
اسم الماده باللغه العربيه	اسم الماده باللغه الانكليزية	الساعات الاسبوعيه		عدد الوحدات
		نظري	عملي	
التحليل الالي-1	Instrumental analysis -1	2	2	3
كيمياء الكم	Quantum Chemistry	2	-	2
الكيمياء الصناعيه-1	Industrial Chemistry-1	2	2	3
الكيمياء الحياتيه السريرية- 1	Bio clinical chemistry-1	2	2	3
حلقية غير متجانسة	Heterocyclic	2	-	2
اللغة الانكليزية-4	English Language-4	2	-	2
مشروع بحث	Research project	2	-	2
المرحلة الرابعة /الفصل الثاني				
اسم الماده باللغه العربيه	اسم الماده باللغه الانكليزية	الساعات الاسبوعيه		عدد الوحدات
		نظري	عملي	
التحليل الالي-2	Instrumental analysis -2	2	2	3
الاطياف	Spectroscopy	2	-	2
الكيمياء الصناعيه-2	Industrial Chemistry-2	2	2	3
الكيمياء الحياتيه السريرية- 2	Bio clinical chemistry-2	2	2	3
كيمياء الضوء	Photochemistry	2	-	2
كيمياء التشخيص العضوي	Identification of organic chemistry	2	6	4

8.مخرجات التعلم المتوقعة للبرنامج

المعـــــــــــرفة	
المعرفة والفهم	1. أن يتعرف الطالب على مفهوم الكيمياء 2. أن يصنف الاحتياجات لتطوير الكيمياء 3. أن يفصل المواصفة الكيميائية حسب نظام الايزو

	4. أن يقيم كلفة صيانة معدات التصنيع الكيميائي
المهـــــــــارات	
المهارات الخاصة بالموضوع	1. معرفة الطالب لمفهوم الكيمياء 2. أهمية الكيمياء في مجالات الحياة 3. تمكين الطالبات من تحاليل تكاليف العمل في مجال الصناعات الكيميائية
مهارات التفكير	1. مهارة التفكير حسب قدرة الطالب (**الهدف من هذه المهارة هو أن يعتقد الطالب بما هو ملموس (قدرات الطالب) وفهم متى وماذا وكيف يجب أن يفكر ويعمل على تحسين القدرة على التفكير بشكل معقول)** 2. مهارة التفكير العالية **(الهدف من هذه المهارة هو تعليم التفكير جيدا قبل يتخذ القرار الذي يحدد حياة الطالب)** 3. مهارات التفكير الناقد **(هي مصطلح يرمز لأعلى مستويات التفكير والتي يهدف إلى طرح مشكلة ما ثم تحليلها**
القيـــــــــم	
طرائق التقييم	1- Exams 2- Learning Matrix(مصفوفة التعلم) 3- Which Face(طريقة التعبير بالوجوه) 4- CAT (التغذية الراجعة من الطلاب) 5- Learning Triangle(مثلث التعلم)

9. استراتيجيات التعليم والتعلم

استراتيجيات التعـــــــــــــلم

1-استراتيجية التفكير حسب قدرة الطالب (مثال : أذا استطاع الطالب أن يتعلم مفهوم الادارة الصحيح يكتسب مهارة أدارة وتنظيم حياته الشخصية) .

2-استراتيجية مهارة التفكير العالية (مثال اذا كان الطالب يرغب في اتخاذ قرار جيد، من المهم أن يفكر جيدا

قبل أن يتخذ القرار و إذا قرر دون تفكير أو إذا كان لا يستطيع التفكير جيدا أو إذا كان لا يستطيع أن يقرر أو ربما لن يقرر فهذا يعني ليس لديه مهارة التفكير العالية).

3-استراتيجية التفكير الناقد في التعلم (Critical Thanking) **(هي مصطلح يرمز لأعلى مستويات التفكير والتي يهدف إلى طرح مشكلة ما ثم تحليلها منطقياً للوصول إلى الحل المطلوب)**.

4-العصف الذهني.

طرائـــــــــــق التعليم والتعلم

1- طريقة القاء المحاضرات .
2- Student Center
3- (المجاميع الطلابية Team Project)
4- (Work shop ورش العمل)
5- (الرحلات العلمية لمتابعة الواقع البيئي)
6- (Learning Technologies on Campus التعلم الالكتروني داخل الحرم الجامعي)
7- (experiential learning التعلم التجريبي)
8 - (Application Learning تطبيق التعليم)

10. طرائـــــــــق التقييم

1- Exams
2- Matrix(مصفوفة التعلم)
3- Which Face(طريقة التعبير بالوجوه)
4- CAT (التغذية الراجعة من الطلاب)
5- Learning Triangle(مثلث التعلم)

11. الهيئـــــــــة التدريسية

اعضاء هيئة التـــــــــدريس

الرتبة العلمية	اسم التدريسي	التخصص		المتطلبات/المهارات الخاصة (ان وجدت)	اعداد الهيئة التدريسية	
		العام	الدقيق		ملاك	محاضر
استاذ	**د.حازم يحيى محمد علي**	الكيمياء	كيمياء فيزيائيه		√	
استاذ	**د.اياد فاضل محمد**	الكيمياء	كيمياء فيزيائيه		√	
استاذ	د.محمد حامد سعيد	الكيمياء	كيمياء لاعضويه		√	
استاذ	**د. طلعت طارق خليل**	الكيمياء	كيمياء حياتيه		√	
استاذ	**د .صادق عبد الحسين كريم**	الكيمياء	كيمياءعضويه/ بوليمر		√	
استاذ	**د.فؤاد فاضل محمد**	الكيمياء	كيمياء تحليليه		√	
استاذ	**د .اسيل مشتاق كاظم**	الكيمياء	كيمياء تحليليه		√	
استاذ مساعد	**د.نور عبد الرزاق**	الكيمياء	كيمياءعضويه		√	
استاذ مساعد	**د.سعاد طه سعد**	الكيمياء	كيمياء لاعضويه		√	
استاذ مساعد	**د.احمد حسن شنتاف**	الكيمياء	كيمياءعضويه		√	
استاذ مساعد	**د.علي طالب بدر**	الكيمياء	كيمياء لاعضويه		√	
استاذ مساعد	**د. زينب هاشم خضير**	الكيمياء	كيمياء تحليليه		√	
استاذ مساعد	**د. زياد عمران موسى**	الكيمياء	كيمياءعضويه		√	

مدرس	**محمد عيدان حسن**	الكيمياء	كيمياء تحليليه		√	
مدرس	**علي محسن محمد**	الكيمياء	كيمياء فيزياويه		√	
مدرس	**شيرين حمزه عباس**	الكيمياء	كيمياء حياتيه		√	
مدرس مساعد	**رنا صلاح نوري**	الكيمياء	كيمياء حياتيه		√	

التطويـــــــــــر المهني

توجيـــــــــه اعضاء هيئة التدريس الجدد

التدريس كأي فن اخر يمكن اكتسابه من خلال ممارسة وأتباع طرقه وأصوله بشرط الرغبة الصادقة مزاولة مهنة التدريس والطريقة في التربية تعني اتخاذ خطوات مترابطة للوصول الى هدف معين ترجى تحقيقهُ. لذلك يجب ان يتبع المبادئ الاساسية في التدريس الجيد والتي هي:

1- توجيه المتعلمين وارشادهم عن طريق خلق مواقف تعليمية تؤدي إلى فعاليات مرغوبة فيها.

2- توفير جو من المحبة والعطف والتعاون بين المعلم والمتعلمين وبين المتعلمين أنفسهم من خلال حبه لطلبته تمييز وعدم الأكثار من التأنيث.

3- اعتماد القيادة الديمقراطية من خلال العلاقة الحسية بين المدرس وطلبته مما يقودهم الى الضبط المبني على الاحترام المتبادل وخلق جو تعاوني بين الطلبة وبين المدرس وطلبته.

التطويـــــــــــر المهني لأعضاء هيئة التدريس

1- استراتيجية التفكير حسب قدرة الطالب (مثال : أذا استطاع الطالب أن يتعلم مفهوم الادارة الصحيح يكتسب مهارة أدارة وتنظيم حياته الشخصية) . و استراتيجية مهارة التفكير العالية (مثال اذا كان الطالب يرغب في اتخاذ قرار جيد، من المهم أن يفكر جيدا قبل أن يتخذ القرار و إذا قرر دون تفكير أو إذا كان لا يستطيع

التفكير جيدا أو إذا كان لا يستطيع أن يقرر أو ربما لن يقرر فهذا يعني ليس لديه مهارة التفكير العالية).

2- المهارات العامة والمنقولة (المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي).

3- التواصل اللفظي .

4- العمل الجماعي.

5- تحليل والتحقيق (جمع المعلومات بشكل منهجي وعلمي لتأسيس الحقائق والمبادئ حل المشكلة).

6- مبادرة (الدافعية على العمل والقدرة على المبادرة، وتحديد الفرص و وضع الأفكار والحلول المطروحة.

12.معيـــــــــــار القبول

قبول مركزي وقبول موازي

13.اهـــــــــم مصادر المعلومات عن البرنامج

1- الموقع الالكتروني للكلية والجامعة.

https://csg.uobabylon.edu.iq/
https://csg.uobabylon.edu.iq/department/?cdid=4

https://csg.uobabylon.edu.iq/department/dep_lectures.aspx?cdid=4

2- دليل الجامعة . https://systems.uobabylon.edu.iq /

3- أهم الكتب والمصادر الخاصة بمكتبة الكلية.

14.خطـــــــــــة تطوير البرنامج

تم تطبيق مسار بولونيا على طلبة المرحلة الاولى والعمل على تطبيقه على المراحل القادمة مع عمل ورش عمل وسمنارات لتعريف اعضاء الهيئة التدريسية على متطلبات مسار بولونيا وكيفية العمل به ومناقشة السلبيات والمعوقات وايجاد الحلول لها. تم تطبيق النظام الالكتروني في عملية التعليم .

مخطط مهارات المنهج																							
يرجى وضع اشارة في المربعات المقابلة لمخرجات التعلم الفردية من البرنامج الخاضعة للتقييم																							
			مخرجات التعلم المطلوبة من البرنامج																				
السنة / المستوى	رمز المقرر	اسم المقرر	اساسي ام اختياري	المعرفة والفهم				المهارات الخاصة بالموضوع				مهارات التفكير				المهارات العامة والمنقولة (أو) المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي							
				أ1	أ2	أ3	أ4	ب1	ب2	ب3	ب4	ج1	ج2	ج3	ج4	د1	د2	د3	د4				
المرحلة الاولى (الكورس الاول)		كيمياء التحليل النوعي	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*				
		اللاعضوية-1	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*				
		علم الخليه	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*				
		السلامه والامن الكيمياوي	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*				
		حقوق الانسان والديمقراطيه	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*				
		اللغة العربيه	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*				

مخطط مهارات المنهج																							
يرجى وضع اشارة في المربعات المقابلة لمخرجات التعلم الفردية من البرنامج الخاضعة للتقييم																							
			مخرجات التعلم المطلوبة من البرنامج																				
السنة / المستوى	رمز المقرر	اسم المقرر	اساسي ام اختياري	المعرفة والفهم				المهارات الخاصة بالموضوع				مهارات التفكير				المهارات العامة والمنقولة (أو) المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي							
				أ1	أ2	أ3	أ4	ب1	ب2	ب3	ب4	ج1	ج2	ج3	ج4	د1	د2	د3	د4				
المرحلة الاولى (الكورس الثاني)		خواص المواد	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*				
		كيمياء التحليل الحجمي	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*				
		اللاعضوية-2	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*				
		الرياضيات	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*				
		الفيزياء	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*				
		برمجة الحاسوب	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*				

مخطط مهارات المنهج

يرجى وضع اشارة في المربعات المقابلة لمخرجات التعلم الفردية من البرنامج الخاضعة للتقييم																							
			مخرجات التعلم المطلوبة من البرنامج																				
السنة / المستوى	رمز المقرر	اسم المقرر	اساسي ام اختياري	المعرفة والفهم				المهارات الخاصة بالموضوع				مهارات التفكير				المهارات العامة والمنقولة (أو) المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي							
				أ1	أ2	أ3	أ4	ب1	ب2	ب3	ب4	ج1	ج2	ج3	ج4	د1	د2	د3	د4				
المرحلة الثانية (الكورس الاول)		كيمياء العناصر الممثله1	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*				
		التحليل الوزني	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*				
		الدينميه الحراريه1	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*				
		الكيمياء العضوية-1	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*				
		المعادلات التفاضليه	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*				
		الحاسوب-2	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*				
		جرائم حزب البعث	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*				

مخطط مهارات المنهج																							
يرجى وضع اشارة في المربعات المقابلة لمخرجات التعلم الفردية من البرنامج الخاضعة للتقييم																							
			مخرجات التعلم المطلوبة من البرنامج																				
السنة / المستوى	رمز المقرر	اسم المقرر	اساسي ام اختياري	المعرفة والفهم				المهارات الخاصة بالموضوع				مهارات التفكير				المهارات العامة والمنقولة (أو) المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي							
				أ1	أ2	أ3	أ4	ب1	ب2	ب3	ب4	ج1	ج2	ج3	ج4	د1	د2	د3	د4				
المرحلة الثانية (الكورس الثاني)		كيمياء العناصر الممثله2	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*				
		طرق الفصل	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*				
		الدينميه الحراريه2	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*				
		الكيمياء العضوية-2	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*				
		الحاسوب-3	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*				
		اللغة الانكليزية-2	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*				

مخطط مهارات المنهج																									
يرجى وضع اشارة في المربعات المقابلة لمخرجات التعلم الفردية من البرنامج الخاضعة للتقييم																									
			مخرجات التعلم المطلوبة من البرنامج																						
السنة / المستوى	رمز المقرر	اسم المقرر	اساسي ام اختياري	المعرفة والفهم				المهارات الخاصة بالموضوع				مهارات التفكير				المهارات العامة والمنقولة (أو) المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي									
				أ1	أ2	أ3	أ4	ب1	ب2	ب3	ب4	ج1	ج2	ج3	ج4	د1	د2	د3	د4						
المرحلة الثالثة (الكورس الاول)		الكيمياء الفيزياوية-1	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*						
		الكيمياء العضوية-1	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*						
		الكيمياء اللاعضويه-1	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*						
		الكيمياء الحياتيه- 1	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*						
		الكيمياء الصناعيه-1	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*						
		البيئه	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*						
		اللغة الانكليزية-3	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*						

مخطط مهارات المنهج																							
يرجى وضع اشارة في المربعات المقابلة لمخرجات التعلم الفردية من البرنامج الخاضعة للتقييم																							
			مخرجات التعلم المطلوبة من البرنامج																				
السنة / المستوى	رمز المقرر	اسم المقرر	اساسي ام اختياري	المعرفة والفهم				المهارات الخاصة بالموضوع				مهارات التفكير				المهارات العامة والمنقولة (أو) المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي							
				أ1	أ2	أ3	أ4	ب1	ب2	ب3	ب4	ج1	ج2	ج3	ج4	د1	د2	د3	د4				
المرحلة الثالثة (الكورس الثاني)		الكيمياء الفيزياوية-2	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*				
		الكيمياء العضوية-2	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*				
		الكيمياء اللاعضويه-2	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*				
		الكيمياء الحياتيه- 2	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*				
		الكيمياء الصناعيه-2	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*				
		نانوتكنولوجي	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*				

مخطط مهارات المنهج
يرجى وضع اشارة في المربعات المقابلة لمخرجات التعلم الفردية من البرنامج الخاضعة للتقييم

السنة / المستوى	رمز المقرر	اسم المقرر	اساسي ام اختياري	مخرجات التعلم المطلوبة من البرنامج															
				المعرفة والفهم				المهارات الخاصة بالموضوع				مهارات التفكير				المهارات العامة والمنقولة (أو) المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي			
				أ1	أ2	أ3	أ4	ب1	ب2	ب3	ب4	ج1	ج2	ج3	ج4	د1	د2	د3	د4
المرحلة الرابعة (الكورس الاول)		التحليل الالي-1	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		كيمياء الكم	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		الكيمياء الصناعيه-1	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		الكيمياء الحياتيه السريرية-1	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		حلقية غير متجانسة	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		اللغة الانكليزية-4	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		مشروع بحث	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

مخطط مهارات المنهج
يرجى وضع اشارة في المربعات المقابلة لمخرجات التعلم الفردية من البرنامج الخاضعة للتقييم

السنة / المستوى	رمز المقرر	اسم المقرر	اساسي ام اختياري	مخرجات التعلم المطلوبة من البرنامج															
				المعرفة والفهم				المهارات الخاصة بالموضوع				مهارات التفكير				المهارات العامة والمنقولة (أو) المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي			
				أ1	أ2	أ3	أ4	ب1	ب2	ب3	ب4	ج1	ج2	ج3	ج4	د1	د2	د3	د4
المرحلة الرابعة (الكورس الثاني)		التحليل الالي-2	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		الاطياف	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		الكيمياء الصناعيه-2	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		الكيمياء الحياتيه السريرية-2	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		كيمياء الضوء	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		تشخيص عضوي	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Science for women Department of Chemistry	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Bio Chemistry-1**			**Module Delivery**	
Module Type	C			**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code					
ECTS Credits	3.00				
SWL (hr/sem)	150				
Module Level			**Semester of Delivery**		
Administering Department			**College**		
Module Leader	**Talat Tariq**		**e-mail**		
Module Leader's Acad. Title	Prof.		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**	None	
Peer Reviewer Name			**e-mail**		
Review Committee Approval			**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 Aims **أهداف المادة الدراسية**	The course aims to: 1- Presentation of organic chemical compounds such as carbohydrates, lipids, vitamins, nucleotides, and nucleic acids. 2- Presenting the chemical structures of organic compounds in the living cell. 3- Explaining the reactions of oxidation, reduction, transport, neutralization, and hydrolysis that take place in the living cell with the help of enzymes. 4- Preparing the student to know the biological importance of nucleotides, DNA, and RNA 5- Discussing the properties of water and its role in living cells. 6- Knowing the importance of biochemistry in applied fields.		
Module Learning Outcomes **مخرجات التعلم للمادة الدراسية**	1. It is well known that Biochemistry is the main subject in chemistry which mean it can be taken in all types of chemistry. 2. Students are able to prepare the accurate concentration for the solutions in any lab they do experiment. 3. Students can handle the chemicals with good experience.		
Indicative Contents **المحتويات الإرشادية**	1. Biochemistry is one of the scientific subjects of great importance in learning about the chemical reactions that take place in the living cells of living organisms, through which you learn about the nature of these reactions, which include the corresponding oxidation, reduction, transport, and hydrolysis reactions, which involve five thousand enzymes that can transform the basic substances (the reactants) into		

	products over a period of time sometimes estimated at nanoseconds. We also learn through this course about carbohydrates, fats, and vitamins, which are one of the biochemical components of the foods that we eat daily in our food.

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	64
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	68
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, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered

Week 1	• Introduction, general introduction, directions and guidelines.
Week 2	• Molecules and life The origin of living molecules Large molecules Building large complexes Models of living cells Properties and functions of cell parts
Week 3	• Water and solutions, properties of water, carbohydrates, their importance, • .
Week 4	• definition and classification, monosaccharides, disaccharides, polysaccharides,. •
Week 5	• derived sugars, acidic sugars, alcoholic sugars, mucosaccharides, chemical reactions
Week 6	• Amino acids, their definition, protein amino acids,.
Week 7	• general properties, chemical structures, rare amino acids in proteins, •
Week 8	• amino acid interactions, peptides and their types, non-protein amino acids, their importance,
Week 9	• the structure of some of them, amino acid interactions, amino acid sequences.
Week 10	• First Exam..
Week 11	• Proteins, their functions, classification, and structure.
Week 12	• Estimating protein levels. Changing natural characteristics.
Week 13	• Lipids, their functions and classification, •
Week 14	• Second Exam.
Week 15	• fats and oils, phosphorylated fats, steroids, waxes, proteins, glycosylated fats, neutral chemical properties.
Week 16	

Delivery Plan (Weekly Lab. Syllabus) **المنهاج الاسبوعي للمختبر**	
	Material Covered
Week 1	Mulch revealed and Silvanov revealed carbohydrates.
Week 2	Bial's detection, Fehlnick's detection, citric acid detection, and parvoid detection
Week 3	Ozaron reactions and iodine detection
Week 4	Revealing the unknown about carbohydrates
Week 5	Fat detection, unsaturation detection
Week 6	copper acetate detection.

Week 7	First test

Learning and Teaching Resources
مصادر التعلم والتدريس

الدلالي ، باسل (1992) البروتينات .

2- الدلالي ، باسل (1994) فهم الأنزيمات (مترجم) .

3- الدلالي ، باسل (1998) الكيمياء الحيوية .

4- المظفر ، سامي .(2001) الكيمياء الحياتية

	Text	Available in the Library?
Required Texts		yes
Recommended Texts		No
Websites		

APPENDIX:

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	**مقبول بقرار**	(45-49)	More work required but credit awarded
	F – Fail	**راسب**	(0-44)	Considerable amount of work required
Note:				

NB 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.

ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي

	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Science for women Department of Chemistry	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	**Bio Chemistry-2**	**Module Delivery**	
Module Type	C	**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code			
ECTS Credits	3.00		
SWL (hr/sem)	150		
Module Level		**Semester of Delivery**	
Administering Department		**College**	

Module Leader	**Talat Tariq**	**e-mail**	
Module Leader's Acad. Title	Prof.	**Module Leader's Qualification**	Ph.D.
Module Tutor		**e-mail**	None
Peer Reviewer Name		**e-mail**	
Review Committee Approval		**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 Aims **أهداف المادة الدراسية**	The course aims to: 1- Presentation of organic chemical compounds such as carbohydrates, lipids, vitamins, nucleotides, and nucleic acids. 2- Presenting the chemical structures of organic compounds in the living cell. 3- Explaining the reactions of oxidation, reduction, transport, neutralization, and hydrolysis that take place in the living cell with the help of enzymes. 4- Preparing the student to know the biological importance of nucleotides, DNA, and RNA 5- Discussing the properties of water and its role in living cells. 6- Knowing the importance of biochemistry in applied fields.		
Module Learning Outcomes **مخرجات التعلم للمادة الدراسية**	4. It is well known that Biochemistry is the main subject in chemistry which mean it can be taken in all types of chemistry. 5. Students are able to prepare the accurate concentration for the solutions in any lab they do experiment.		

	6. Students can handle the chemicals with good experience.
Indicative Contents **المحتويات الإرشادية**	2. Biochemistry is one of the scientific subjects of great importance in learning about the chemical reactions that take place in the living cells of living organisms, through which you learn about the nature of these reactions, which include the corresponding oxidation, reduction, transport, and hydrolysis reactions, which involve five thousand enzymes that can transform the basic substances (the reactants) into products over a period of time sometimes estimated at nanoseconds. We also learn through this course about carbohydrates, fats, and vitamins, which are one of the biochemical components of the foods that we eat daily in our food.
Learning and Teaching Strategies **استراتيجيات التعلم والتعليم**	
Strategies	

Student Workload (SWL) **الحمل الدراسي للطالب**			
Structured SWL (h/sem) **الحمل الدراسي المنتظم للطالب خلال الفصل**	64	**Structured SWL (h/w)** **الحمل الدراسي المنتظم للطالب أسبوعيا**	64
Unstructured SWL (h/sem) **الحمل الدراسي غير المنتظم للطالب خلال الفصل**	68	**Unstructured SWL (h/w)** **الحمل الدراسي غير المنتظم للطالب أسبوعيا**	68
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, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) **المنهاج الاسبوعي النظري**	
	Material Covered
Week 1	• Nucleotides, nucleosides, nucleic acids, functions of nucleotides, nitrogenous bases, their types, nucleic acids, DNA, double helix structure, hydrogen bonding, RNA and its types.
Week 2	• , functions of nucleotides, nitrogenous bases,
Week 3	types, nucleic acids, DNA, double helix structure,
Week 4	hydrogen bonding, RNA and its types.
Week 5	Vitamins and their importance, fat-soluble vitamins, their types
Week 6	drawing the chemical structures of some of them, water-soluble vitamins, their types,
Week 7	• First exam.
Week 8	• enzymatic conjugates, the chemical structure of some of them, enzymatic conjugates other than vitamins.
Week 9	• Enzymes, their general properties, life applications, classification,
Week 10	• Michelin-Finest equation, active sites, enzyme inhibitors, enzymes of similar origin, regulatory enzymes, enzyme compounds, factors affecting the speed of the enzymatic reaction.
Week 11	Energy, its types, transfer, standard free energy, ATP and its importance
Week 12	• ADP and energy transfer, the role of phosphate compounds.
Week 13	Hormones, their classification, chemical formula
Week 14	secretory glands, insulin and glucocorticoid hormones and their importance
Week 15	Second Exam
Week 16	

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Rosenheim reaction Millon reaction
Week 2	Zakakuji reaction, reactions of sulphide amino acids
Week 3	- Lead sulfide detection, biuret detection
Week 4	Precipitation of amino acids with neutral salts
Week 5	Uncover the unknown
Week 6	- Detection of the quality of amino acids by paper electrophoresis
Week 7	First test

Learning and Teaching Resources
مصادر التعلم والتدريس

الدلالي ، باسل (1992) البروتينات .

2- الدلالي ، باسل (1994) فهم الأنزيمات (مترجم) .

3- الدلالي ، باسل (1998) الكيمياء الحيوية .

4- المظفر ، سامي .(2001) الكيمياء الحياتية

	Text	Available in the Library?
Required Texts		yes
Recommended Texts		No
Websites		

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	**التقدير**	**Marks (%)**	**Definition**
Success Group	**A** - Excellent	**امتياز**	90 - 100	Outstanding Performance

(50 - 100)	**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	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:

NB 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.

ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Industrial Chemistry-1**			**Module Delivery**	
Module Type	C			**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code					
ECTS Credits	2.00				
SWL (hr/sem)	150				
Module Level			**Semester of Delivery**		
Administering Department			**College**		
Module Leader	**Mohammed Eidan**		**e-mail**		
Module Leader's Acad. Title	Lecture		**Module Leader's Qualification**		
Module Tutor			**e-mail**	None	
Peer Reviewer Name			**e-mail**		
Review Committee Approval			**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 Aims **أهداف المادة الدراسية**	The course aims to: 1- Make students able to know the different types of industrial reactors.		

	2- Make students able to know the industrial foundations for preparing some industrial products. 3- Providing students with skills in diagnosing and knowing industrial foundations. 4- Providing students with the necessary experiences to be able to enter the field of the chemical industry. 5- Students' knowledge of industrial units and their applications for producing industrial products. 6- Learn about the various types of cement industry. 7- Increasing industrial laboratories and learning about the progress of industrial operations. 8- Identify the food industries and their importance in the national economy. 9- Be aware of the danger resulting from chemical environmental pollution. 10- Learn how to treat water for industrial purposes.
Module Learning Outcomes **مخرجات التعلم للمادة الدراسية**	7. It is well known that industrial chemistry is the main subject in chemistry which mean it can be taken in all types of chemistry. 8. Students are able to prepare the accurate concentration for the solutions in any lab they do experiment. 9. Students can handle the chemicals with good experience.
Indicative Contents **المحتويات الإرشادية**	3. The course aims for the department's students to acquire information and skills that will make them able to understand industrial processes and their accompanying chemical and transformational changes to lay the necessary foundation for developing a strategy for building factories and laboratories.
Learning and Teaching Strategies **استراتيجيات التعلم والتعليم**	
Strategies	

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	64
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	68
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, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	• Introduction, general introduction, directions and guidelines.
Week 2	• Introduction, general introduction, directions and guidelines.
Week 3	• Introduction to industrial chemistry..
Week 4	• Chemical manufacturing process technology.
Week 5	• Types of industrial reactors
Week 6	• Heterogeneous reactors.
Week 7	• Chemical process flow thickeners.
Week 8	• Water treatment for industrial purposes,
Week 9	• Industrial pollution.

Week 10	• First Exam.
Week 11	• Corrosion.
Week 12	• Cement industry ..
Week 13	• Second month exam.
Week 14	• Paper Industry, .
Week 15	Sugar industry
Week 16	

Delivery Plan (Weekly Lab. Syllabus) **المنهاج الاسبوعي للمختبر**	
	Material Covered
Week 1	لايوجد عملي في هذه الماده
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources

مصادر التعلم والتدريس1- الكيمياء الصناعية د. كوركيس عبد ال ادم 1992 .

2-Cary coyne(1997) . chemistry and the chemical
3-Frank,M.dunnivat.(2004).Enviromental laboratory excexcises for industrument analysis and environmental chemistry.
4-Harold .F.W.Taylor.(1990).cement chemistry.

	Text	**Available in the Library?**
Required Texts		yes

Recommended Texts		No
Websites		

APPENDIX:

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	**مقبول بقرار**	(45-49)	More work required but credit awarded
	F – Fail	**راسب**	(0-44)	Considerable amount of work required
Note:				

NB 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.

ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي

	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Science for women Department of Chemistry	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Industrial Chemistry-2**			**Module Delivery**	
Module Type	C			**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code					
ECTS Credits	2.00				
SWL (hr/sem)	150				
Module Level			**Semester of Delivery**		
Administering Department			**College**		
Module Leader	**Mohammed Eidan**		**e-mail**		
Module Leader's Acad. Title	Lecture		**Module Leader's Qualification**		
Module Tutor			**e-mail**	None	
Peer Reviewer Name			**e-mail**		
Review Committee Approval			**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 Aims **أهداف المادة الدراسية**	The course aims to: 1- Make students able to know the different types of industrial reactors. 2- Make students able to know the industrial foundations for preparing some industrial products. 3- Providing students with skills in diagnosing and knowing industrial foundations. 4- Providing students with the necessary experiences to be able to enter the field of the chemical industry. 5- Students' knowledge of industrial units and their applications for producing industrial products. 6- Learn about the various types of cement industry. 7- Increasing industrial laboratories and learning about the progress of industrial operations. 8- Identify the food industries and their importance in the national economy. 9- Be aware of the danger resulting from chemical environmental pollution. 10- Learn how to treat water for industrial purposes.		
Module Learning Outcomes **مخرجات التعلم للمادة الدراسية**	10. It is well known that industrial chemistry is the main subject in chemistry which mean it can be taken in all types of chemistry. 11. Students are able to prepare the accurate concentration for the solutions in any lab they do experiment. 12. Students can handle the chemicals with good experience.		
Indicative Contents	4. The course aims for the department's students to acquire		

المحتويات الإرشادية	information and skills that will make them able to understand industrial processes and their accompanying chemical and transformational changes to lay the necessary foundation for developing a strategy for building factories and laboratories.

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	64
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	68
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, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	• Introduction, general introduction, directions and guidelines.

Week 2	• Introduction, general introduction, directions and guidelines.
Week 3	• Introduction to industrial chemistry..
Week 4	• Chemical manufacturing process technology.
Week 5	• Types of industrial reactors
Week 6	• Fertilizer industry.
Week 7	• Chemical process flow thickeners.
Week 8	• Dyes industry.
Week 9	• Industrial pollution.
Week 10	• First Exam.
Week 11	• Sulphide industries.
Week 12	• Cement industry
Week 13	• Second month exam.
Week 14	• Pesticide industry
Week 15	Second Exam
Week 16	

Delivery Plan (Weekly Lab. Syllabus) **المنهاج الاسبوعي للمختبر**	
	Material Covered
Week 1	لايوجد عملي في هذه الماده
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources

مصادر التعلم والتدريس

مصادر التعلم والتدريس1- الكيمياء الصناعية د. كوركيس عبد ال ادم 1992 .

2-Cary coyne(1997) . chemistry and the chemical

3-Frank,M.dunnivat.(2004).Enviromental laboratory excexcises for industrument analysis and environmental chemistry.

4-Harold .F.W.Taylor.(1990).cement chemistry.

	Text	Available in the Library?
Required Texts		yes
Recommended Texts		No
Websites		

APPENDIX:

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	**مقبول بقرار**	(45-49)	More work required but credit awarded
	F – Fail	**راسب**	(0-44)	Considerable amount of work required
Note:				

NB 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.

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	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Science for women Department of Chemistry	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	**Organic Chemistry-1**	**Module Delivery**	
Module Type	C	**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code			
ECTS Credits	3.00		
SWL (hr/sem)	150		
Module Level		**Semester of Delivery**	
Administering Department		**College**	

Module Leader	**Ahmed Hassan**	**e-mail**	
Module Leader's Acad. Title	Assist.Prof.	**Module Leader's Qualification**	Ph.D.
Module Tutor		**e-mail**	None
Peer Reviewer Name		**e-mail**	
Review Committee Approval		**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 Aims **أهداف المادة الدراسية**	The course aims to: 1- Naming, preparation and reactions of aldehydes and ketones and the mechanics of their reactions. 2- Naming, preparation and reactions of carboxylic acids and the mechanics of their reactions. 3- Naming, preparation and reactions of carboxylic acid derivatives and the mechanics of their reactions. 4- Stereochemistry terms, preparation and reactions of stereoisomers. 5- Naming, preparation and reactions of amines and the mechanics of their reactions. 6- Naming, preparation and reactions of phenols and the mechanics of their reactions. 7- Naming, preparation and reactions of aryl halides and the mechanics of their reactions. 8- Carban negative ion reactions (1). 9- Carban negative ion reactions (2).		

Module Learning Outcomes **مخرجات التعلم للمادة الدراسية**	13. It is well known that Organic chemistry is the main subject in chemistry which mean it can be taken in all types of chemistry. 14. Students are able to prepare the accurate concentration for the solutions in any lab they do experiment. 15. Students can handle the chemicals with good experience.
Indicative Contents **المحتويات الإرشادية**	Organic chemistry for the third stage is considered complementary to the second stage, as it deals with aldehydes, ketones, carboxylic acids and their derivatives, amines, phenols, and aryl halides, and their naming methods, preparations, and interactions, as well as stereochemistry and reaction mechanics, as well as polycyclic compounds and heterogeneous compounds, and methods for naming them, preparations, and interactions.
Learning and Teaching Strategies **استراتيجيات التعلم والتعليم**	
Strategies	

Student Workload (SWL) **الحمل الدراسي للطالب**			
Structured SWL (h/sem) **الحمل الدراسي المنتظم للطالب خلال الفصل**	64	**Structured SWL (h/w)** **الحمل الدراسي المنتظم للطالب أسبوعيا**	64
Unstructured SWL (h/sem) **الحمل الدراسي غير المنتظم للطالب خلال الفصل**	68	**Unstructured SWL (h/w)** **الحمل الدراسي غير المنتظم للطالب أسبوعيا**	68
Total SWL (h/sem) **الحمل الدراسي الكلي للطالب خلال الفصل**	150		

Module Evaluation **تقييم المادة الدراسية**				
	Time/Nu	**Weight (Marks)**	**Week Due**	**Relevant Learning**

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

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	• Naming aldehydes and ketones and their first physical properties
Week 2	• - Preparation of aldehydes and ketones II
Week 3	• - Reactions of aldehydes and ketones
Week 4	• - Naming the fourth carboxylic acids
Week 5	• - Preparation of fifth carboxylic acids
Week 6	• - Reactions of sixth carboxylic acids
Week 7	• First exam.
Week 8	• - Naming derivatives of carboxylic acids VII
Week 9	• - Preparation of derivatives of carboxylic acids VIII
Week 10	• - Reactions of carboxylic acid derivatives IX
Week 11	• - Stereochemistry.
Week 12	• - Amines, their names, properties, and preparations
Week 13	• - Reactions of the thirteenth amines
Week 14	• Second Exam.
Week 15	• - Phenols, their names, properties, and preparations XIV • - Reactions of phenols XV • - Aryl halides, their names, properties, and preparations sixteenth • - Reactions of aryl halides.
Week 16	

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	- The first risks of chemicals
Week 2	- Preparation of diphenylmethane II
Week 3	- Preparation of benzophenone from diphenylmethane III
Week 4	Preparation of benzophenone from benzoyl IV chloride
Week 5	- Preparation of benzophenone oxime V
Week 6	- Sixth Beckman reaction
Week 7	First test

Learning and Teaching Resources

مصادر التعلم والتدريس

Organic chemistry by R. Morrisn and R. boyd ,4th Edition Allyn and Bacon1998

2-الكيمياء العضوية فهدعلي حسين وجماعته الجزء الاول جامعة بغداد 1977

Organic reaction mechanisms by Groutas, William 1st edition 2000

	Text	Available in the Library?
Required Texts		yes
Recommended Texts		No
Websites		

APPENDIX:

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	**مقبول بقرار**	(45-49)	More work required but credit awarded
	F – Fail	**راسب**	(0-44)	Considerable amount of work required

Note:
NB 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.

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	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Science for women Department of Chemistry	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	Organic Chemistry-2	Module Delivery
Module Type	C	Theory Lecture Lab Tutorial Practical Seminar
Module Code		
ECTS Credits	3.00	
SWL (hr/sem)	150	

Module Level		Semester of Delivery	
Administering Department		College	
Module Leader	Ahmed Hassan	e-mail	
Module Leader's Acad. Title	Assist.Prof.	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	None
Peer Reviewer Name		e-mail	
Review Committee Approval		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 Aims أهداف المادة الدراسية	The course aims to: 1- Naming, preparation and reactions of aldehydes and ketones and the mechanics of their reactions. 2- Naming, preparation and reactions of carboxylic acids and the mechanics of their reactions. 3- Naming, preparation and reactions of carboxylic acid derivatives and the mechanics of their reactions. 4- Stereochemistry terms, preparation and reactions of stereoisomers. 5- Naming, preparation and reactions of amines and the mechanics

	of their reactions. 6- Naming, preparation and reactions of phenols and the mechanics of their reactions. 7- Naming, preparation and reactions of aryl halides and the mechanics of their reactions. 8- Carban negative ion reactions (1). 9- Carban negative ion reactions (2).
Module Learning Outcomes **مخرجات التعلم للمادة الدراسية**	16. It is well known that Organic chemistry is the main subject in chemistry which mean it can be taken in all types of chemistry. 17. Students are able to prepare the accurate concentration for the solutions in any lab they do experiment. 18. Students can handle the chemicals with good experience.
Indicative Contents **المحتويات الإرشادية**	Organic chemistry for the third stage is considered complementary to the second stage, as it deals with aldehydes, ketones, carboxylic acids and their derivatives, amines, phenols, and aryl halides, and their naming methods, preparations, and interactions, as well as stereochemistry and reaction mechanics, as well as polycyclic compounds and heterogeneous compounds, and methods for naming them, preparations, and interactions.
Learning and Teaching Strategies **استراتيجيات التعلم والتعليم**	
Strategies	

Student Workload (SWL) **الحمل الدراسي للطالب**

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	64
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	68
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, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	• - Aryl halides, their names, properties, and preparations sixteenth •
Week 2	• - Reactions of the seventeenth aryl halides • - Examination of the eighteenth second month • • . •
Week 3	• - Carbanion 1, nineteenth edition •
Week 4	• - Carbanion 1 Reactions Twenty •
Week 5	• - Carbanion 2, twenty-first edition
Week 6	• Carbanion Reactions 2 xxii
Week 7	• First exam.
Week 8	• - Alpha Beta for unsaturated carbon compounds twenty-third •

Week 9	• - Reactions of unsaturated carbon compounds twenty-fourth •
Week 10	• - Polycyclic aromatic compounds twenty-fifth •
Week 11	• - Interactions of polycyclic aromatic compounds twenty-sixth • . •
Week 12	• - Heterocyclic compounds, nomenclature, and preparation twenty-seventh •
Week 13	• - Its interactions.
Week 14	• Chemistry of internal transition elements (lactanes), general properties, applications, classification
Week 15	Second Exam
Week 16	General Review

Delivery Plan (Weekly Lab. Syllabus) **المنهاج الاسبوعي للمختبر**	
	Material Covered
Week 1	Fisher reaction
Week 2	Preparation of benzoic acid
Week 3	Preparation of nitrobenzene
Week 4	Preparation of aniline
Week 5	Preparation of phenol from aniline
Week 6	Preparation of diazo benzene
Week 7	First test

Learning and Teaching Resources

مصادر التعلم والتدريس

Organic chemistry by R. Morrisn and R. boyd ,4th Edition Allyn and Bacon1998

2-الكيمياء العضوية فهدعلي حسين وجماعته الجزء الاول جامعة بغداد 1977

Organic reaction mechanisms by Groutas, William 1st edition 2000

	Text	Available in the Library?
Required Texts		yes
Recommended Texts		No
Websites		

APPENDIX:

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	**مقبول بقرار**	(45-49)	More work required but credit awarded
	F – Fail	**راسب**	(0-44)	Considerable amount of work required
Note:				

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	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Science for women Department of Chemistry	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Physical Chemistry-1**			**Module Delivery**	
Module Type	C			**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code					
ECTS Credits	3.00				
SWL (hr/sem)	150				
Module Level			**Semester of Delivery**		
Administering Department			**College**		
Module Leader	**Ayad Mohammed**		**e-mail**		
Module Leader's Acad. Title	Prof.		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**	None	
Peer Reviewer Name			**e-mail**		
Review Committee Approval			**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 Aims **أهداف المادة الدراسية**	The course aims to: 1- Give a general idea about Faraday's laws 2- Connecting electrolytic conductors and metal conductors 3- Identify the types of connectivity 4- How to calculate the degree of ionization for weak electrolytes 5- The effect of concentration and temperature on conductivity 6- Identify methods for calculating transition numbers 7- Calculating the dissolution yield constant 8- Linking solution chemistry and thermodynamics 9- Study of simple and complex reaction kinetics 10- Study the effect of temperature on the speed of reactions 11- Increasing the student's ability to understand the technique of receiving devices related to physical chemistry. 12- Introducing the student to how to link theoretical concepts and practical applications. 13- Teaching the student how to solve assignments 14- Improving the student's ability to write scientific reports		
Module Learning Outcomes	19. It is well known that Physical chemistry is the main subject in chemistry which mean it can be taken in all types of		

مخرجات التعلم للمادة الدراسية	chemistry. 20. Students are able to prepare the accurate concentration for the solutions in any lab they do experiment. 21. Students can handle the chemicals with good experience.
Indicative Contents المحتويات الإرشادية	5. It is well known that Physical chemistry is the main subject in chemistry which mean it can be taken in all types of chemistry.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	64
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	68
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, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All

Total assessment	100% (100 Marks)		

Delivery Plan (Weekly Syllabus) **المنهاج الاسبوعي النظري**	
	Material Covered
Week 1	• Chemistry and electricity. • Potential differences at interfaces.
Week 2	• Electrochemical cells. • Transport of charge within the cell.
Week 3	• Electrodes and electrode reactions. • Cell description conventions
Week 4	• Standard half-cell potentials. • Reference electrodes. • Prediction of cell potentials. • Cell potentials and the electromotive series. • Cell potentials and free energy.
Week 5	• The Nernst equation. • Concentration cells.
Week 6	• Analytical applications of the Nernst equation. • Determination of solubility products.
Week 7	• First exam.
Week 8	• Potentiometric titrations. • Measurement of pH.
Week 9	• Membrane potentials.
Week 10	• Batteries and fuel cells.
Week 11	• The fuel cell ..
Week 12	• Electrochemical Corrosion. • Control of corrosion.
Week 13	• Electrolytic cells. • Electrolysis involving water. • Faraday's laws of electrolysis
Week 14	• Second Exam.
Week 15	• Industrial electrolytic processes.
Week 16	

Delivery Plan (Weekly Lab. Syllabus) **المنهاج الاسبوعي للمختبر**

	Material Covered
Week 1	Define the cell constant
Week 2	- Determine the equivalent conductivity of the weak acid at different concentrations and calculate the dissociation constant of the acid
Week 3	Determine the equivalent conductivity of a strong electrolyte solution and test the validity of Unsaker's theory
Week 4	- Determine the difference in the equivalent ionic conductivity of two ions from two completely dissociated salts
Week 5	- Determine the solubility of lead sulphate or silver chromate in water at 25°C
Week 6	Determine the degree of decomposition of aniline chloride in aqueous solution at 25°C.
Week 7	First test

Learning and Teaching Resources

مصادر التعلم والتدريس

Physical Chemistry, Atkins, 6th ed. 2001

- **.Problems in physical chemistry 1st , by K.K. Shrma,1994**
- **.Physical chemistry 5th by Walter J. Moor, 1972**
- **.Physical chemistry 7th by Robert Al-Berty, 1987**

	Text	Available in the Library?
Required Texts		yes
Recommended Texts		No
Websites		

APPENDIX:

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	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:

NB 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.

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	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Science for women Department of Chemistry	

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Physical Chemistry-2**			**Module Delivery**	
Module Type	C			**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code					
ECTS Credits	3.00				
SWL (hr/sem)	150				
Module Level			**Semester of Delivery**		
Administering Department			**College**		
Module Leader	**Ayad Mohammed**		**e-mail**		
Module Leader's Acad. Title	Prof.		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**	None	
Peer Reviewer Name			**e-mail**		
Review Committee Approval			**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 Aims **أهداف المادة الدراسية**	The course aims to: 1- Give a general idea about Faraday's laws 2- Connecting electrolytic conductors and metal conductors		

	3- Identify the types of connectivity 4- How to calculate the degree of ionization for weak electrolytes 5- The effect of concentration and temperature on conductivity 6- Identify methods for calculating transition numbers 7- Calculating the dissolution yield constant 8- Linking solution chemistry and thermodynamics 9- Study of simple and complex reaction kinetics 10- Study the effect of temperature on the speed of reactions 11- Increasing the student's ability to understand the technique of receiving devices related to physical chemistry. 12- Introducing the student to how to link theoretical concepts and practical applications. 13- Teaching the student how to solve assignments 14- Improving the student's ability to write scientific reports
Module Learning Outcomes **مخرجات التعلم للمادة الدراسية**	22. It is well known that Physical chemistry is the main subject in chemistry which mean it can be taken in all types of chemistry. 23. Students are able to prepare the accurate concentration for the solutions in any lab they do experiment. 24. Students can handle the chemicals with good experience.
Indicative Contents **المحتويات الإرشادية**	6. It is well known that Physical chemistry is the main subject in chemistry which mean it can be taken in all types of chemistry.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	64
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	68
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, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	• Chemical kinetics ,general information
Week 2	• First order of reaction
Week 3	• Second order of reaction
Week 4	• The speed of the reaction
Week 5	• Order of reaction and half-life-.

Week 6	• Determine the order of the reactions
Week 7	• Calculation
Week 8	• First exam.
Week 9	• Complex Interactions
Week 10	• Molecular reaction
Week 11	• - Relaxation method
Week 12	• - Arrhenius Equation
Week 13	• Theories of reaction speed.
Week 14	• - Thermodynamics of the transition state
Week 15	• Second Exam.
Week 16	

Delivery Plan (Weekly Lab. Syllabus) **المنهاج الاسبوعي للمختبر**	
	Material Covered
Week 1	General experience in determining the rank of the first reaction
Week 2	Determine the order of the reaction and the rate constant for the
Week 3	decomposition of the ester in the presence of acid as the second catalyst
Week 4	Determine the rate constant for the dissociation of diazonium III salt
Week 5	Study the effect of acid as a catalyst in the decomposition of ester IV
Week 6	Determine the activation energy for the decomposition of the fifth ester
Week 7	First test

Learning and Teaching Resources

مصادر التعلم والتدريس

Physical Chemistry, Atkins, 6th ed. 2001

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- **.Physical chemistry 5th by Walter J. Moor, 1972**
- **.Physical chemistry 7th by Robert Al-Berty, 1987**

	Text	Available in the Library?
Required Texts		yes
Recommended Texts		No
Websites		

APPENDIX:

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	**مقبول بقرار**	(45-49)	More work required but credit awarded
	F – Fail	**راسب**	(0-44)	Considerable amount of work required
Note:				

NB 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.

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	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Science for women Department of Chemistry	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Inorganic Chemistry-1**			**Module Delivery**	
Module Type	C			**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code					
ECTS Credits	3.00				
SWL (hr/sem)	150				
Module Level			**Semester of Delivery**		
Administering Department			**College**		
Module Leader	**Suad Taha Saad**		**e-mail**		
Module Leader's Acad. Title	Assist.Prof.		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**	None	
Peer Reviewer Name			**e-mail**		
Review Committee Approval			**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 Aims **أهداف المادة الدراسية**	The course aims to: The course aims to introduce the student to theoretical inorganic chemistry by identifying the elements of the periodic table under study. 7- Distinguish between transitional elements through their periodic properties. 8- Interpreting complexes through different theories of association. 9- Interpreting the complex spectra of these elements and benefiting from that practically.		
Module Learning Outcomes **مخرجات التعلم للمادة الدراسية**	25. It is well known that Coordination chemistry is the main subject in chemistry which mean it can be taken in all types of chemistry. 26. Students are able to prepare the accurate concentration for the solutions in any lab they do experiment. 27. Students can handle the chemicals with good experience.		
Indicative Contents **المحتويات الإرشادية**	7. Coordination chemistry specializes in the study of coordination compounds or metal complexes. The complex compound consists of the union of an atom or a central ion with one or more ligands (negative or positive ions or neutral molecules). The properties of the resulting complex differ completely from the properties of any of its components. Coordination chemistry is also concerned with studying		

	theories of interpretation. Coordination compounds, methods of preparing them, stabilization, and mechanics of their interactions.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	64
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	68
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, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	• Introduction to the chemistry of transition elements, some of their periodic properties, states

Week 2	• Oxidation of transition elements, coordination numbers,
Week 3	• types of ligands, and naming coordination complexes.
Week 4	• A historical overview of the development of coordination chemistry, string theory, Werner's theory
Week 5	• Effective atomic number theory, valence bond theory, hybridization of atomic orbitals, crystal field theory.
Week 6	• First exam.
Week 7	• The stabilization energy of the crystal field for high-spin and low-spin complexes, a comparison between the valence string theory and the crystal field theory.
Week 8	• Molecular orbital theory
Week 9	• Spectral properties of complexes •
Week 10	• Magnetic properties of complexes • .
Week 11	• Methods of preparing complexes, substitution reactions in aqueous solvents and in their absence, •
Week 12	• Oxidation and reduction reactions,
Week 13	• mechanism of substitution of ligands (SN1, SN2).
Week 14	• Second Exam.
Week 15	• thermal dissociation reactions of complexes.
Week 16	

Delivery Plan (Weekly Lab. Syllabus) **المنهاج الاسبوعي للمختبر**	
	Material Covered
Week 1	Hazards of chemicals, and safety tips in the first laboratory
Week 2	Preparation of potassium dioxalate and dihydrochrome (III) II
Week 3	Preparation of triastenitomanganese (III) III
Week 4	Iron Chemistry IV
Week 5	Preparation of iron complex with phenanthroline V
Week 6	Preparation of potassium ferrite trioxalate VI

Week 7	First test

Learning and Teaching Resources
مصادر التعلم والتدريس

د. نعمان ألنعيمي "الكيمياء اللاعضوية" الجزء ألاول و الثاني ، مطبعة جامعة بغداد، 1978.

1- د. أحسان عبد الغني مصطفى " الكيمياء اللاعضوية والتناسقية" ، مطبعة جامعة الموصل، 1988.

2- د. باسم محمد سعيد " الكيمياء اللاعضوية العملي " ، مطبعة جامعة الموصل ، 1987.

3- P.J.Durrant " General and inorganic chemistry" , 3rd edition, Dai Nippon Printing Co(H.K) Ltd, 1964.

4- J.D. Lee " Consice inorganic chemistry", 1970.

5- M.R.Wright " An Introduction to Aqueos Electrolyte Solution" , John wiley and sons, 2007

	Text	Available in the Library?
Required Texts		yes
Recommended Texts		No
Websites		

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	**التقدير**	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	**امتياز**	90 - 100	Outstanding Performance
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Fail Group (0 – 49)	**FX** – Fail	**مقبول بقرار**	(45-49)	More work required but credit awarded
	F – Fail	**راسب**	(0-44)	Considerable amount of work required

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	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Science for women Department of Chemistry	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	**Inorganic Chemistry-2**	**Module Delivery**	
Module Type	C	**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code			
ECTS Credits	3.00		
SWL (hr/sem)	150		
Module Level		**Semester of Delivery**	

Administering Department		**College**	
Module Leader	**Suad Taha Saad**	**e-mail**	
Module Leader's Acad. Title	Assist.Prof.	**Module Leader's Qualification**	Ph.D.
Module Tutor		**e-mail**	None
Peer Reviewer Name		**e-mail**	
Review Committee Approval		**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 Aims **أهداف المادة الدراسية**	The course aims to: The course aims to introduce the student to theoretical inorganic chemistry by identifying the elements of the periodic table under study. 7- Distinguish between transitional elements through their periodic properties. 8- Interpreting complexes through different theories of association. 9- Interpreting the complex spectra of these elements and benefiting from that practically.		
Module Learning Outcomes **مخرجات التعلم للمادة الدراسية**	28. It is well known that Coordination chemistry is the main subject in chemistry which mean it can be taken in all types of chemistry. 29. Students are able to prepare the accurate concentration for the solutions in any lab they do experiment.		

	30. Students can handle the chemicals with good experience.
Indicative Contents **المحتويات الإرشادية**	8. Coordination chemistry specializes in the study of coordination compounds or metal complexes. The complex compound consists of the union of an atom or a central ion with one or more ligands (negative or positive ions or neutral molecules). The properties of the resulting complex differ completely from the properties of any of its components. Coordination chemistry is also concerned with studying theories of interpretation. Coordination compounds, methods of preparing them, stabilization, and mechanics of their interactions.
Learning and Teaching Strategies **استراتيجيات التعلم والتعليم**	
Strategies	

Student Workload (SWL) **الحمل الدراسي للطالب**			
Structured SWL (h/sem) **الحمل الدراسي المنتظم للطالب خلال الفصل**	64	**Structured SWL (h/w)** **الحمل الدراسي المنتظم للطالب أسبوعيا**	64
Unstructured SWL (h/sem) **الحمل الدراسي غير المنتظم للطالب خلال الفصل**	68	**Unstructured SWL (h/w)** **الحمل الدراسي غير المنتظم للطالب أسبوعيا**	68
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, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7

	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) **المنهاج الاسبوعي النظري**	
	Material Covered
Week 1	• Introduction to the chemistry of transition elements, some of their periodic properties, states
Week 2	• Oxidation of transition elements, coordination numbers,
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Week 12	• Oxidation and reduction reactions,
Week 13	• mechanism of substitution of ligands (SN1, SN2).
Week 14	• Second Exam.
Week 15	• thermal dissociation reactions of complexes.
Week 16	

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Hazards of chemicals, and safety tips in the first laboratory
Week 2	Preparation of potassium dioxalate and dihydrochrome (III) II
Week 3	Preparation of triastenitomanganese (III) III
Week 4	Iron Chemistry IV
Week 5	Preparation of iron complex with phenanthroline V
Week 6	Preparation of potassium ferrite trioxalate VI
Week 7	First test

Learning and Teaching Resources
مصادر التعلم والتدريس

د. نعمان ألنعيمي "الكيمياء اللاعضوية" الجزء ألاول و الثاني ، مطبعة جامعة بغداد، 1978.

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5- .M.R.Wright " An Introduction to Aqueos Electrolyte Solution" , John wiley and sons, 2007

	Text	Available in the Library?
Required Texts		yes
Recommended Texts		No
Websites		

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	**التقدير**	**Marks (%)**	**Definition**
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Fail Group (0 – 49)	**FX** – Fail	**مقبول بقرار**	(45-49)	More work required but credit awarded
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Note:				

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	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Science for women Department of Chemistry	

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**English Language-3**			**Module Delivery**	
Module Type	S			**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code					
ECTS Credits	2.00				
SWL (hr/sem)	150				
Module Level			**Semester of Delivery**		
Administering Department			**College**		
Module Leader	**Ahmed Rodan**		**e-mail**		
Module Leader's Acad. Title	Assist. Prof.		**Module Leader's Qualification**	Ph.D	
Module Tutor			**e-mail**	None	
Peer Reviewer Name			**e-mail**		
Review Committee Approval			**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 Aims **أهداف المادة الدراسية**	The course aims to: 1- Explaining the material in a clear and understandable way for all students. 2. Involve students in discussing and solving exercises.		

	3- Explaining the study material using various methods An explanation to develop students' abilities and break boredom in the classroom
Module Learning Outcomes **مخرجات التعلم للمادة الدراسية**	31. The student's understanding of the material 32. The ability to analyze and apply what you have learned practically on the English 33. The evaluation should be done by presenting the material to the students in the laboratory and then applying it
Indicative Contents **المحتويات الإرشادية**	9. The theoretical method and explanation is by presenting the material on the Point Power program in the form of diagrams and pictures 10. This is to attract the student's attention and help him not feel bored. The practical method is to apply what has been presented 11. On the calculator and conduct daily and monthly exams..
Learning and Teaching Strategies **استراتيجيات التعلم والتعليم**	
Strategies	

Student Workload (SWL) **الحمل الدراسي للطالب**			
Structured SWL (h/sem) **الحمل الدراسي المنتظم للطالب خلال الفصل**	64	**Structured SWL (h/w)** **الحمل الدراسي المنتظم للطالب أسبوعيا**	64
Unstructured SWL (h/sem) **الحمل الدراسي غير المنتظم للطالب خلال الفصل**	68	**Unstructured SWL (h/w)** **الحمل الدراسي غير المنتظم للطالب أسبوعيا**	68
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, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) **المنهاج الاسبوعي النظري**	
	Material Covered
Week 1	• The concept of ecology and its connection with other science
Week 2	• Naming tenses, present past and present perfect The first
Week 3	• Present simple tenses and conditions The second
Week 4	• Past tenses Third
Week 5	• Advice obligation and permission Fourth
Week 6	• Future forms
Week 7	• Information questions Sixth
Week 8	• Reported swim
Week 9	• Passion and fashions
Week 10	• First Exam.
Week 11	• Verb patterns ninth
Week 12	Conditionals
Week 13	• Second month exam.
Week 14	• Noun phrases
Week 15	• Models of probability second tenth
Week 16	

Delivery Plan (Weekly Lab. Syllabus) **المنهاج الاسبوعي للمختبر**	
	Material Covered
Week 1	لايوجد عملي في هذه الماده

Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources

مصادر التعلم والتدريس

Stern, H.H. (1992). Issues and options in language teaching (edited posthumously by Patrick Allen & Birgit Harley). Oxford: Oxford University Press. Ur, P. (1996). A Course in Language Teaching. Cambridge: Cambridge University Press. Vermes, A. (2010). Translation in foreign language teaching: A brief overview of pros and cons, Eger, Journal of English Studies, 10, 83-93.

	Text	**Available in the Library?**
Required Texts		yes
Recommended Texts		No
Websites		

APPENDIX:

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	**مقبول بقرار**	(45-49)	More work required but credit awarded
	F – Fail	**راسب**	(0-44)	Considerable amount of work required
Note:				

NB 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.

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	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Science for women Department of Chemistry	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية		
Module Title	**Nanotechnology**	**Module Delivery**

Module Type	B	**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code			
ECTS Credits	2.00		
SWL (hr/sem)	150		

Module Level		**Semester of Delivery**	
Administering Department		**College**	
Module Leader	**Ayad Mohammed**	**e-mail**	
Module Leader's Acad. Title	Prof.	**Module Leader's Qualification**	Ph.D
Module Tutor		**e-mail**	None
Peer Reviewer Name		**e-mail**	
Review Committee Approval		**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 Aims **أهداف المادة الدراسية**	The course aims to: 1- Developing students' ability to understand the characteristics of the nanotechnology, types of nanotechnology, 2- Providing students with the knowledge and ideas to identify the most important sources for obtaining nanotechnology 3. Enabling students to understand the basic rules of the nanotechnology .
Module Learning Outcomes	34. That students become familiar with nanotechnology scientists. 35. For students to distinguish between the main type of

مخرجات التعلم للمادة الدراسية	nanotechnology
Indicative Contents المحتويات الإرشادية	12. The course aims for the department's students to acquire information and skills that will make them able to understand industrial processes and their accompanying chemical and transformational changes to lay the necessary foundation for developing a strategy for building factories and laboratories.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	64
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	68
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, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	• A historical overview of nanotechnology.
Week 2	• Basics of nanotechnology
Week 3	• Types of nanotechnology depending on the shape
Week 4	• What do we mean by nanotechnology
Week 5	• Devices used to study nanotechnology
Week 6	• Nanotechnology preparation
Week 7	• Characteristics of nanocomposites
Week 8	• First exam
Week 9	• Physical methods for preparing nanotechnology
Week 10	• Chemical methods for preparing nanotechnology.
Week 11	• Applications of nanotechnology in industry
Week 12	• Applications of nanotechnology in medicine
Week 13	• Second month exam.
Week 14	• Applications of nanotechnology in electronics
Week 15	• Military nanotechnology applications
Week 16	

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	لايوجد عملي في هذه الماده
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	

Week 7	

Learning and Teaching Resources
مصادر التعلم والتدريس

NANOTECHNOLOGY A COMPLETE GUIDE - 2020 EDITION PAPERBACK – MARCH 8, 2021
Gerardus Blokdykby

	Text	Available in the Library?
Required Texts		yes
Recommended Texts		No
Websites		

APPENDIX:

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	**مقبول بقرار**	(45-49)	More work required but credit awarded
	F – Fail	**راسب**	(0-44)	Considerable amount of work required
Note:				

NB 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.

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	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Science for women Department of Chemistry	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية				
Module Title	**Environmental**		**Module Delivery**	
Module Type	B		**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code				
ECTS Credits	2.00			
SWL (hr/sem)	150			
Module Level			**Semester of Delivery**	
Administering Department			**College**	

Module Leader	**Zainab Hashim**	**e-mail**	
Module Leader's Acad. Title	Assist. Prof.	**Module Leader's Qualification**	Ph.D
Module Tutor		**e-mail**	None
Peer Reviewer Name		**e-mail**	
Review Committee Approval		**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 Aims **أهداف المادة الدراسية**	The course aims to: 1- Developing students' ability to understand the characteristics of the environment, pollution, types of pollutants, their causes, and treatments within the real environment. 2- Providing students with the knowledge and ideas to identify the most important sources for obtaining environmental geographic data Including data available at the Ministry of Health, Environment and Meteorology and the Central Bureau of Statistics as well About books and references regarding the subject. 3. Enabling students to understand the basic rules of the environment and activating its role in its development on the ground.		
Module Learning Outcomes **مخرجات التعلم للمادة الدراسية**	36. That students become familiar with environmental and pollution scientists. 37. For students to distinguish between the main and secondary concentrations of pollutants and how to find immediate treatments as temporary solutions to the problem.		

	38. Students should differentiate between geography and environmental science. 39. Enabling students to write research in the field of environment and pollution. 40. For students to write about the most important sources of environmental science. 41. Enabling students to discuss and explain the importance of the environment in their lives.
Indicative Contents **المحتويات الإرشادية**	13. The course aims for the department's students to acquire information and skills that will make them able to understand industrial processes and their accompanying chemical and transformational changes to lay the necessary foundation for developing a strategy for building factories and laboratories.
Learning and Teaching Strategies **استراتيجيات التعلم والتعليم**	
Strategies	

Student Workload (SWL) **الحمل الدراسي للطالب**			
Structured SWL (h/sem) **الحمل الدراسي المنتظم للطالب خلال الفصل**	64	**Structured SWL (h/w)** **الحمل الدراسي المنتظم للطالب أسبوعيا**	64
Unstructured SWL (h/sem) **الحمل الدراسي غير المنتظم للطالب خلال الفصل**	68	**Unstructured SWL (h/w)** **الحمل الدراسي غير المنتظم للطالب أسبوعيا**	68
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, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7

	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) **المنهاج الاسبوعي النظري**	
	Material Covered
Week 1	• The concept of ecology and its connection with other sciences
Week 2	• Knowledge of the branches of ecology, which include 1- Aquatic ecology 2- Land ecology
Week 3	• The concept of the ecosystem and the structure of the ecosystem
Week 4	• Identify the abiotic and biotic components
Week 5	• Identify the geochemical and life cycles
Week 6	• Learn about the water cycle in nature
Week 7	• Identify the carbon cycle in nature
Week 8	• Identify the sulfur cycle in nature
Week 9	• Identify the path of the phosphorus cycle in nature
Week 10	• First Exam.
Week 11	• Identify the concept of pollution and its impact on health
Week 12	• Identify air pollution
Week 13	• Second month exam.
Week 14	• Identifying water pollution Identify soil pollution
Week 15	Identify the risks of population growth and its impact on the environment
Week 16	

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	لايوجد عملي في هذه الماده
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources
مصادر التعلم والتدريس

1-Anonymous.(2003).An Introductions to modified food starch
2-chia.LL.(2003).Purification of laboratory chemicals.
3-Cary coyne(1997) . chemistry and the chemical
4-Frank,M.dunnivat.(2004).Enviromental laboratory excexcises for industrument analysis and environmental chemistry.

	Text	Available in the Library?
Required Texts		yes
Recommended Texts		No
Websites		

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	**التقدير**	**Marks (%)**	**Definition**
Success Group	**A -** Excellent	**امتياز**	90 - 100	Outstanding Performance

(50 - 100)	**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	**مقبول بقرار**	(45-49)	More work required but credit awarded
	F – Fail	**راسب**	(0-44)	Considerable amount of work required

Note:

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	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Science for women Department of Biology	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Instrumental chemistry1**		**Module Delivery**		
Module Type	C		**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**		
Module Code					
ECTS Credits	3.00				
SWL (hr/sem)	150				
Module Level			**Semester of Delivery**		
Administering Department			**College**		
Module Leader	**Aseal Mushtaq**		**e-mail**		
Module Leader's Acad. Title	Assist.Prof.		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**	None	
Peer Reviewer Name			**e-mail**		
Review Committee Approval			**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 Aims **أهداف المادة الدراسية**	The course aims to: The tremendous development in modern analysis techniques has led to a major qualitative change in the tasks of the chemical analyst. The accuracy, speed, and reliability of the new devices made chemistry break into many fields that were previously impossible. The mission of the current course is to introduce the student to the most important recent developments in the field of chemical analysis and to provide him with the necessary practical experience in using various techniques to make him a pioneering element in the process of solid scientific construction of the country.		
Module Learning Outcomes **مخرجات التعلم للمادة الدراسية**	1. The course objective is to introduce the students to modern instrumental techniques and analytical approaches within Chemical analysis, environmental and soil chemistry, food chemistry and plant biology. 2. After completing the course the student should be able to: 3. Knowledge: 4. Describe the theory of sampling, sample preparation and sample preparation techniques. 5. Refer to the chemical theory behind the use of modern instrumental techniques for quantitative chemical analysis. 6. Describe how to identify unknown compounds by spectroscopy and mass spectrometry and to measure their concentration in environmental and food samples. 7. Skills: 8. Develop and apply methods for separating chemical compounds in mixtures using chromatography. 9. Perform quantitative chemical analysis of organic compounds		

	and metals. 10. Apply solid data processing and evaluation of analytical data. 11. Competences: 12. Develop, validate and apply analytical methods in different field of research 13. Evaluate and discuss analytical chemical data from the literature. 14. Do problem solving in analytical chemistry. .
Indicative Contents **المحتويات الإرشادية**	1. Lectures: The lectures will present the general chemical background of the measurement principles and instrumental techniques as well as theory on sampling, data processing, data analysis, quality assurance and method validation. 2. 3. Theoretical exercises: These exercises will train the students to carry out calculations on the data produced from different instrumental techniques including statistical analysis..
Learning and Teaching Strategies **استراتيجيات التعلم والتعليم**	
Strategies	

Student Workload (SWL) **الحمل الدراسي للطالب**			
Structured SWL (h/sem) **الحمل الدراسي المنتظم للطالب خلال الفصل**	64	**Structured SWL (h/w)** **الحمل الدراسي المنتظم للطالب أسبوعيا**	64
Unstructured SWL (h/sem) **الحمل الدراسي غير المنتظم للطالب خلال الفصل**	68	**Unstructured SWL (h/w)** **الحمل الدراسي غير المنتظم للطالب أسبوعيا**	68
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, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to analytical chemistry Choosing the analysis method
Week 2	An introduction to spectroscopic method
Week 3	Solution of problems and discussion
Week 4	Interaction of radiation and matter
Week 5	Molecular absorption
Week 6	First exam
Week 7	Beer's law
Week 8	Problem solutions and discussion
Week 9	Optical spectroscopic instruments
Week 10	Types of monochromators
Week 11	Radiation detectors
Week 12	Photometers
Week 13	Spectrophotometers

Week 14	Problems solution and discussion
Week 15	Second exam
Week 16	

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Determine the maximum absorption wavelength (λmax) of a permanganate solution
Week 2	Determine the pH of acid and base solution
Week 3	Gas chromatography
Week 4	Paper chromatography
Week 5	Flame Photometry
Week 6	Absorption and Emission Spectrometery
Week 7	Exam

Learning and Teaching Resources
مصادر التعلم والتدريس

"D. A. Skoog, F. J. Holler, T. A. Niemann, "Principles of Instrumental Analysis، Thompson, Brooks, Cole, 6th Edition, 2007.

Harris, D.C. Quantitative Chemical Analysis, 7th Edition, W.H. Freeman, New York, 2007.
G.H. Jeffery, J. Bassett, J. Mendham and R. C. Denney, "Vogels Textbook of Quantitative Chemical Analysis" Fifth Edition, Longman Scientific & Technical, 1989.

	Text	Available in the Library?
Required Texts		yes
Recommended Texts		No
Websites		

APPENDIX:

GRADING SCHEME

مخطط الدرجات				
Group	**Grade**	**التقدير**	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	**امتياز**	90 - 100	Outstanding Performance
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Fail Group (0 – 49)	**FX** – Fail	**مقبول بقرار**	(45-49)	More work required but credit awarded
	F – Fail	**راسب**	(0-44)	Considerable amount of work required
Note:				

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	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Science for women Department of Biology	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Instrumental chemistry2**			**Module Delivery**	
Module Type	C			**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code					
ECTS Credits	3.00				
SWL (hr/sem)	150				
Module Level			**Semester of Delivery**		
Administering Department			**College**		
Module Leader	**Aseal Mushtaq**		**e-mail**		
Module Leader's Acad. Title	Assist.Prof.		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**	None	
Peer Reviewer Name			**e-mail**		
Review Committee Approval			**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 Aims **أهداف المادة الدراسية**	The course aims to: The tremendous development in modern analysis techniques has led to a major qualitative change in the tasks of the chemical analyst. The accuracy, speed, and reliability of the new devices made chemistry break into many fields that were previously impossible. The mission of the current course is to introduce the student to the most important recent developments in the field of chemical analysis and to provide him with the necessary practical experience in using various techniques to make him a pioneering element in the process of solid scientific construction of the country.
Module Learning Outcomes **مخرجات التعلم للمادة الدراسية**	15. The course objective is to introduce the students to modern instrumental techniques and analytical approaches within Chemical analysis, environmental and soil chemistry, food chemistry and plant biology. 16. After completing the course the student should be able to: 17. Knowledge: 18. Describe the theory of sampling, sample preparation and sample preparation techniques. 19. Refer to the chemical theory behind the use of modern instrumental techniques for quantitative chemical analysis. 20. Describe how to identify unknown compounds by spectroscopy and mass spectrometry and to measure their concentration in environmental and food samples. 21. Skills: 22. Develop and apply methods for separating chemical compounds in mixtures using chromatography. 23. Perform quantitative chemical analysis of organic compounds and metals. 24. Apply solid data processing and evaluation of analytical data.

	25. Competences: 26. Develop, validate and apply analytical methods in different field of research 27. Evaluate and discuss analytical chemical data from the literature. 28. Do problem solving in analytical chemistry.
Indicative Contents **المحتويات الإرشادية**	4. Lectures: The lectures will present the general chemical background of the measurement principles and instrumental techniques as well as theory on sampling, data processing, data analysis, quality assurance and method validation. 5. 6. Theoretical exercises: These exercises will train the students to carry out calculations on the data produced from different instrumental techniques including statistical analysis.
Learning and Teaching Strategies **استراتيجيات التعلم والتعليم**	
Strategies	

Student Workload (SWL) **الحمل الدراسي للطالب**			
Structured SWL (h/sem) **الحمل الدراسي المنتظم للطالب خلال الفصل**	64	**Structured SWL (h/w)** **الحمل الدراسي المنتظم للطالب أسبوعيا**	64
Unstructured SWL (h/sem) **الحمل الدراسي غير المنتظم للطالب خلال الفصل**	68	**Unstructured SWL (h/w)** **الحمل الدراسي غير المنتظم للطالب أسبوعيا**	68
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, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Principles of separation operations Separation by sedimentation Extraction methods
Week 2	Extraction applications Ion exchange
Week 3	Introduction to separation chromatography General description of the chromatography device Velocity theory in chromatography Separation columns, detection and analysis devices Qualitative and quantitative analysis by chromatographic analysis
Week 4	Liquid chromatography
Week 5	Ultra-performance liquid chromatography principles and applications
Week 6	First exam
Week 7	Principles of electromigration The mechanical method, working conditions and preparation Factors affecting separation processes Applications of electromigration
Week 8	Microscopic analysis of elements C, N, H, O and S
Week 9	The jihadist method General principles Hydrogen electrode Selective electrodes the accounts
Week 10	Voltammetric and coulombic analysis methods
Week 11	Principles of anodic dislocation
Week 12	Static (stable) jihadism Coulometric
Week 13	Ampere calibration
Week 14	Thermogravimetric analysis, Mechanisms and applications
Week 15	Second exam
Week 16	

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Thin layer chromatography Salvage of separated materials by plastering technique
Week 2	Specific diagnosis of alcohols using chromatography
Week 3	applications of gas chromatography, such as separating petroleum components
Week 4	Analysis of the elements carbon, hydrogen, oxygen, and nitrogen using gas chromatography
Week 5	Determination of copper using gravimetric electrolysis at constant current
Week 6	Coulomb titration of cyclohexane with bromine
Week 7	Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

"D. A. Skoog, F. J. Holler, T. A. Niemann, "Principles of Instrumental Analysis، Thompson, Brooks, Cole, 6th Edition, 2007.

Harris, D.C. Quantitative Chemical Analysis, 7th Edition, W.H. Freeman, New York, 2007.
G.H. Jeffery, J. Bassett, J. Mendham and R. C. Denney, "Vogels Textbook of Quantitative Chemical Analysis" Fifth Edition, Longman Scientific & Technical, 1989

	Text	Available in the Library?
Required Texts		yes
Recommended Texts		No
Websites		

APPENDIX:

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	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

NB 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.

ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي

	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Science for women Department of Chemistry	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Clinical biochemistry-2**			**Module Delivery**	
Module Type	C			**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code					
ECTS Credits	3.00				
SWL (hr/sem)	150				
Module Level			**Semester of Delivery**		
Administering Department			**College**		
Module Leader	**Talat Tariq**		**e-mail**		
Module Leader's Acad. Title	Prof.		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**	None	
Peer Reviewer Name			**e-mail**		
Review Committee Approval			**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 Aims **أهداف المادة الدراسية**	The course aims to: 1. Knowing life energy and how it is liberated and transmitted. 2. Knowing high-energy particles and how they are formed. 3. Presentation of carbohydrate products and the pathways through which glucose enters. 4. Deduce the causes of diabetes and the role of hormones in it.		

	5. Discuss fat metabolism, fat oxidation, and the pathways involved in producing energy. 6. Showing the construction of some fats within the body of an organism. 7. Discuss the metabolism of proteins and the utilization of amino acids in the building process. .
Module Learning Outcomes **مخرجات التعلم للمادة الدراسية**	29. Metabolism is the result or group of chemical reactions that take place in the cell of an organism. The number of chemical reactions within an organism ranges from hundreds to thousands of reactions. These chemical reactions are responsible for supporting and ensuring the growth of the living organism. These reactions perform their work with a precise system of balancing and checking by the organism's body. These reactions take place according to a path that means production or generation. 30. Metabolism was divided into construction or catabolism, meaning that the process of construction is the formation of large molecules from small molecules, while catabolism is the opposite, i.e. the breaking down of molecules.
Indicative Contents **المحتويات الإرشادية**	7. Lectures: The lectures will present the general chemical background of the measurement principles and instrumental techniques as well as theory on sampling, data processing, data analysis, quality assurance and method validation. 8. 9. Theoretical exercises: These exercises will train the students to carry out calculations on the data produced from different instrumental techniques including statistical analysis..
Learning and Teaching Strategies **استراتيجيات التعلم والتعليم**	
Strategies	

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	64
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	68
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, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to metabolism, its importance, types, and high-energy molecules.
Week 2	Carbohydrate metabolism.
Week 3	The process of glucose dissolution.
Week 4	Krebs cycle
Week 5	Exam
Week 6	The process of generating glucose, the process of breaking down and building glycogen
Week 7	Introduction to fats
Week 8	Fat metabolism

Week 9	Beta and alpha oxidation
Week 10	Building phospholipids
Week 11	First written exam
Week 12	- Proteins
Week 13	Metabolism of proteins
Week 14	Urea cycle
Week 15	Amino acid metabolism and construction
Week 16	

Delivery Plan (Weekly Lab. Syllabus) **المنهاج الاسبوعي للمختبر**	
	Material Covered
Week 1	introduction to the laboratory glassware and equipment used in experiments.
Week 2	Estimating blood sugar in the blood serum. The seventh week: Using anonym to estimate biological components
Week 3	Determination of cholesterol in blood serum. The fourth week: Determination of triglycerides in blood serum. The fifth and sixth weeks: Determination of urea in blood serum.
Week 4	Determination of triglycerides in blood serum.
Week 5	Determination of urea in blood serum.
Week 6	Determination of urea in blood serum.
Week 7	Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

Clinical biochemistry Allan Gaw , Robert A. Cowan Dienic St Michael J . Stewart 2nd edition 1999 CHURCHILL Livinstone.

Clinical biochemistry A laboratory Perspective Wendy Arneson and Jean Brickell 2007.

المظفر ، سامي .(2001) الكيمياء الحياتية

	Text	Available in the Library?
Required Texts		yes
Recommended Texts		No
Websites		

APPENDIX:

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	**مقبول بقرار**	(45-49)	More work required but credit awarded
	F – Fail	**راسب**	(0-44)	Considerable amount of work required
Note:				

NB 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.

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	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Science for women Department of Chemistry	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	**Clinical biochemistry-2**	**Module Delivery**	
Module Type	C	**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code			
ECTS Credits	3.00		
SWL (hr/sem)	150		
Module Level		**Semester of Delivery**	
Administering Department		**College**	

Module Leader	**Talat Tariq**	**e-mail**	
Module Leader's Acad. Title	Prof.	**Module Leader's Qualification**	Ph.D.
Module Tutor		**e-mail**	None
Peer Reviewer Name		**e-mail**	
Review Committee Approval		**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 Aims **أهداف المادة الدراسية**	The course aims to: 1. Knowing life energy and how it is liberated and transmitted. 2. Knowing high-energy particles and how they are formed. 3. Presentation of carbohydrate products and the pathways through which glucose enters. 4. Deduce the causes of diabetes and the role of hormones in it. 5. Discuss fat metabolism, fat oxidation, and the pathways involved in producing energy. 6. Showing the construction of some fats within the body of an organism. 7. Discuss the metabolism of proteins and the utilization of amino acids in the building process. .		
Module Learning Outcomes **مخرجات التعلم للمادة الدراسية**	31. Metabolism is the result or group of chemical reactions that take place in the cell of an organism. The number of chemical reactions within an organism ranges from hundreds to thousands of reactions. These chemical reactions are responsible for supporting and ensuring the growth of the		

	living organism. These reactions perform their work with a precise system of balancing and checking by the organism's body. These reactions take place according to a path that means production or generation. 32. Metabolism was divided into construction or catabolism, meaning that the process of construction is the formation of large molecules from small molecules, while catabolism is the opposite, i.e. the breaking down of molecules.
Indicative Contents **المحتويات الإرشادية**	10. Lectures: The lectures will present the general chemical background of the measurement principles and instrumental techniques as well as theory on sampling, data processing, data analysis, quality assurance and method validation. 11. 12. Theoretical exercises: These exercises will train the students to carry out calculations on the data produced from different instrumental techniques including statistical analysis..
Learning and Teaching Strategies **استراتيجيات التعلم والتعليم**	
Strategies	

Student Workload (SWL) **الحمل الدراسي للطالب**			
Structured SWL (h/sem) **الحمل الدراسي المنتظم للطالب خلال الفصل**	64	**Structured SWL (h/w)** **الحمل الدراسي المنتظم للطالب أسبوعيا**	64
Unstructured SWL (h/sem) **الحمل الدراسي غير المنتظم للطالب خلال الفصل**	68	**Unstructured SWL (h/w)** **الحمل الدراسي غير المنتظم للطالب أسبوعيا**	68
Total SWL (h/sem) **الحمل الدراسي الكلي للطالب خلال الفصل**	150		

Module Evaluation **تقييم المادة الدراسية**				
	Time/Nu	**Weight (Marks)**	**Week Due**	**Relevant Learning**

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

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Nucleotide metabolism, ribonucleotide biosynthesis, catabolic and final catabolic
Week 2	synthesis of purines,
Week 3	final catabolism of pyrimidines.
Week 4	Replication, reproduction
Week 5	Exam
Week 6	translation of genetic information
Week 7	Digestion, absorption.
Week 8	regulation of vital functions
Week 9	Liver functions
Week 10	Blood composition
Week 11	Blood functions
Week 12	- Proteins
Week 13	Metabolism of proteins
Week 14	Amino acid metabolism and construction
Week 15	Second Exam
Week 16	

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	introduction to the laboratory glassware and equipment used in experiments.
Week 2	Determination of alkaline phosphatase enzyme.
Week 3	determination of the enzyme acid phosphatase. Estimation of biological components in unknown serum
Week 4	Determination of bilirubin in blood serum.
Week 5	Determination of uric acid in blood serum.
Week 6	Determination of iron in blood serum.
Week 7	Exam

Learning and Teaching Resources
مصادر التعلم والتدريس

-1 Clinical biochemistry Allan Gaw , Robert A. Cowan Dienic St Michael J . Stewart 2nd edition 1999 CHURCHILL Livinstone.

Clinical biochemistry A laboratory Perspective Wendy Arneson and Jean Brickell 2007.

	Text	Available in the Library?
Required Texts		yes
Recommended Texts		No
Websites		

APPENDIX:

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	**مقبول بقرار**	(45-49)	More work required but credit awarded
	F – Fail	**راسب**	(0-44)	Considerable amount of work required

Note:

NB 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.

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Ministry of Higher Education and Scientific Research - Iraq
University of Babylon
College of Science for women
Department of Chemistry

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Instrumental chemistry2**			**Module Delivery**	
Module Type	C			**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code					
ECTS Credits	3.00				
SWL (hr/sem)	150				
Module Level			**Semester of Delivery**		
Administering Department			**College**		
Module Leader	**Aseal Mushtaq**		**e-mail**		
Module Leader's Acad. Title	Assist.Prof.		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**	None	
Peer Reviewer Name			**e-mail**		
Review Committee Approval			**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 Aims **أهداف المادة الدراسية**	The course aims to: The tremendous development in modern analysis techniques has led to a major qualitative change in the tasks of the chemical analyst. The accuracy, speed, and reliability of the new devices made		

	chemistry break into many fields that were previously impossible. The mission of the current course is to introduce the student to the most important recent developments in the field of chemical analysis and to provide him with the necessary practical experience in using various techniques to make him a pioneering element in the process of solid scientific construction of the country.
Module Learning Outcomes **مخرجات التعلم للمادة الدراسية**	33. The course objective is to introduce the students to modern instrumental techniques and analytical approaches within Chemical analysis, environmental and soil chemistry, food chemistry and plant biology. 34. After completing the course the student should be able to: 35. Knowledge: 36. Describe the theory of sampling, sample preparation and sample preparation techniques. 37. Refer to the chemical theory behind the use of modern instrumental techniques for quantitative chemical analysis. 38. Describe how to identify unknown compounds by spectroscopy and mass spectrometry and to measure their concentration in environmental and food samples. 39. Skills: 40. Develop and apply methods for separating chemical compounds in mixtures using chromatography. 41. Perform quantitative chemical analysis of organic compounds and metals. 42. Apply solid data processing and evaluation of analytical data. 43. Competences: 44. Develop, validate and apply analytical methods in different field of research 45. Evaluate and discuss analytical chemical data from the literature. 46. Do problem solving in analytical chemistry.

	.
Indicative Contents **المحتويات الإرشادية**	13. Lectures: The lectures will present the general chemical background of the measurement principles and instrumental techniques as well as theory on sampling, data processing, data analysis, quality assurance and method validation. 14. 15. Theoretical exercises: These exercises will train the students to carry out calculations on the data produced from different instrumental techniques including statistical analysis..
Learning and Teaching Strategies **استراتيجيات التعلم والتعليم**	
Strategies	

Student Workload (SWL) **الحمل الدراسي للطالب**			
Structured SWL (h/sem) **الحمل الدراسي المنتظم للطالب خلال الفصل**	64	**Structured SWL (h/w)** **الحمل الدراسي المنتظم للطالب أسبوعيا**	64
Unstructured SWL (h/sem) **الحمل الدراسي غير المنتظم للطالب خلال الفصل**	68	**Unstructured SWL (h/w)** **الحمل الدراسي غير المنتظم للطالب أسبوعيا**	68
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, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All

Total assessment	100% (100 Marks)		

Delivery Plan (Weekly Syllabus) **المنهاج الاسبوعي النظري**	
	Material Covered
Week 1	- Introduction to the polymers -
Week 2	Naming the polymers
Week 3	- Preparation of polymers Synthesis
Week 4	-Polymerization conditions
Week 5	- Polymer reactions
Week 6	- Diagnosis of polymers -
Week 7	First exam
Week 8	Physical properties of polymers
Week 9	- The most important industrial polymers
Week 10	**Modification of natural polymers**
Week 11	**Monomers and repeat units**
Week 12	The microstructure of a polymer
Week 13	**Monomer arrangement in copolymers**
Week 14	Polymer morphology
Week 15	Second exam

Delivery Plan (Weekly Lab. Syllabus) **المنهاج الاسبوعي للمختبر**

	Material Covered
Week 1	laboratory instructions
Week 2	Preparation of the Rayon's
Week 3	Polymerization of acrylonitrile
Week 4	Preparation of nitrocellulose
Week 5	Preparation of phenol formaldehyde
Week 6	Preparation of urea formaldehyde Urea acetaldehyde reaction
Week 7	Exam

Learning and Teaching Resources
مصادر التعلم والتدريس

1- 1989 (الطبعة الثانية) د.ذنون محمد بيريادي و د.كوركيس عبد آل أدم . كيمياء الجزئيات الكبيرة /

2- 1986 (الطبعة الأولى) د.كوركيس عبد آل أدم .الكيمياء الصناعية /

3- كيمياء الجزئيات الكبيرة العملي / د.ذنون محمد بيريادي 1989 .

	Text	Available in the Library?
Required Texts		yes
Recommended Texts		No
Websites		

APPENDIX:

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	**مقبول بقرار**	(45-49)	More work required but credit awarded
	F – Fail	**راسب**	(0-44)	Considerable amount of work required
Note:				

NB 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.

ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي

Ministry of Higher Education and Scientific Research - Iraq
University of Babylon
College of Science for women
Department of Biology

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Industrial Chemistry-1**			**Module Delivery**	
Module Type	B			**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code					
ECTS Credits	2.00				
SWL (hr/sem)	150				
Module Level			**Semester of Delivery**		
Administering Department			**College**		
Module Leader	**Ahmed Hassan**		**e-mail**		
Module Leader's Acad. Title	Assist.Prof.		**Module Leader's Qualification**	Ph.D	
Module Tutor			**e-mail**	None	
Peer Reviewer Name			**e-mail**		
Review Committee Approval			**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 Aims **أهداف المادة الدراسية**	The course aims to: - A general idea about polymers and their natural and industrial sources. 2- Types of polymers. 3- Names of some commercial and scientific polymers. 4- General methods for preparing polymers. 5- The most important polymer reactions.		

	6- Find the molecular weight of polymers. 7- Methods of diagnosing polymers. 8- The most important polymers found in our daily lives. 9- Knowledge of the nature of oil, its filtering and processing. 10- Evaluation of oil and its derivatives
Module Learning Outcomes **مخرجات التعلم للمادة الدراسية**	47. Lectures: The lectures will present the general chemical background of the measurement principles and instrumental techniques as well as theory on sampling, data processing, data analysis, quality assurance and method validation. 48. 49. Theoretical exercises: These exercises will train the students to carry out calculations on the data produced from different instrumental techniques including statistical analysis.. 50. Enabling students to discuss and explain the importance of the environment in their lives.
Indicative Contents **المحتويات الإرشادية**	16. The course aims for the department's students to acquire information and skills that will make them able to understand industrial processes and their accompanying chemical and transformational changes to lay the necessary foundation for developing a strategy for building factories and laboratories.
Learning and Teaching Strategies **استراتيجيات التعلم والتعليم**	
Strategies	

Student Workload (SWL) **الحمل الدراسي للطالب**			
Structured SWL (h/sem) **الحمل الدراسي المنتظم للطالب خلال الفصل**	64	**Structured SWL (h/w)** **الحمل الدراسي المنتظم للطالب أسبوعيا**	64
Unstructured SWL (h/sem) **الحمل الدراسي غير المنتظم للطالب خلال الفصل**	68	**Unstructured SWL (h/w)** **الحمل الدراسي غير المنتظم للطالب أسبوعيا**	68
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, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Oil, its chemical composition and evaluation
Week 2	Petroleum filtration
Week 3	Chemical processes in filtration
Week 4	First month exam
Week 5	Petroleum products
Week 6	Petrochemical industries
Week 7	Thermal solution of the formation of alkenes, alkynes, and their derivatives
Week 8	Oil, its chemical composition and evaluation
Week 9	Petroleum filtration
Week 10	Chemical processes in filtration
Week 11	First month exam

Week 12	Petroleum products
Week 13	Petrochemical industries
Week 14	Thermal solution of the formation of alkenes, alkynes, and their derivatives
Week 15	Oil, its chemical composition and evaluation
Week 16	

Delivery Plan (Weekly Lab. Syllabus) **المنهاج الاسبوعي للمختبر**	
	Material Covered
Week 1	لايـوجد عمـلـي فـي هـذه الـمـاده
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources
مصادر التعلم والتدريس

مصادر التعلم والتدريس1- الكيمياء الصناعية د. كوركيس عبد ال ادم 1992 .

2-Cary coyne(1997) . chemistry and the chemical

3-Frank,M.dunnivat.(2004).Enviromental laboratory excexcises for industrument analysis and environmental chemistry.

4-Harold .F.W.Taylor.(1990).cement chemistry.

	Text	**Available in the Library?**
Required Texts		yes
Recommended Texts		No

Websites	

APPENDIX:

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	**مقبول بقرار**	(45-49)	More work required but credit awarded
	F – Fail	**راسب**	(0-44)	Considerable amount of work required
Note:				

NB 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.

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	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Science for women Department of Chemistry	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**English Language-3**			**Module Delivery**	
Module Type	S			**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code					
ECTS Credits	2.00				
SWL (hr/sem)	150				
Module Level			**Semester of Delivery**		
Administering Department			**College**		
Module Leader	**Ahmed Rodan**		**e-mail**		
Module Leader's Acad. Title	Assist. Prof.		**Module Leader's Qualification**	Ph.D	
Module Tutor			**e-mail**	None	
Peer Reviewer Name			**e-mail**		
Review Committee Approval			**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 Aims **أهداف المادة الدراسية**	The course aims to: 1- Explaining the material in a clear and understandable way for all students. 2. Involve students in discussing and solving exercises. 3- Explaining the study material using various methods An explanation to develop students' abilities and break boredom in the classroom
Module Learning Outcomes **مخرجات التعلم للمادة الدراسية**	51. The student's understanding of the material 52. The ability to analyze and apply what you have learned practically on the English 53. The evaluation should be done by presenting the material to the students in the laboratory and then applying it
Indicative Contents **المحتويات الإرشادية**	17. The theoretical method and explanation is by presenting the material on the Point Power program in the form of diagrams and pictures 18. This is to attract the student's attention and help him not feel bored. The practical method is to apply what has been presented 19. On the calculator and conduct daily and monthly exams..

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) **الحمل الدراسي المنتظم للطالب خلال الفصل**	64	**Structured SWL (h/w)** **الحمل الدراسي المنتظم للطالب أسبوعيا**	64

Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	68
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, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	• The concept of ecology and its connection with other science
Week 2	• Naming tenses, present past and present perfect The first
Week 3	• Present simple tenses and conditions The second
Week 4	• Past tenses Third
Week 5	• Advice obligation and permission Fourth
Week 6	• Future forms
Week 7	• Information questions Sixth
Week 8	• Reported swim
Week 9	• Passion and fashions
Week 10	• First Exam.
Week 11	• Verb patterns ninth
Week 12	Conditionals
Week 13	• Second month exam.
Week 14	• Noun phrases

Week 15	• Models of probability second tenth
Week 16	

Delivery Plan (Weekly Lab. Syllabus) **المنهاج الاسبوعي للمختبر**	
	Material Covered
Week 1	لايـوجد عمـلـي فـي هذه الـمـاده
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources
مصادر التعلم والتدريس

Stern, H.H. (1992). Issues and options in language teaching (edited posthumously by Patrick Allen & Birgit Harley). Oxford: Oxford University Press. Ur, P. (1996). A Course in Language Teaching. Cambridge: Cambridge University Press. Vermes, A. (2010). Translation in foreign language teaching: A brief overview of pros and cons, Eger, Journal of English Studies, 10, 83-93.

	Text	**Available in the Library?**
Required Texts		yes
Recommended Texts		No
Websites		

APPENDIX:

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	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:

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MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Identification of organic chemistry**			**Module Delivery**	
Module Type	C			**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code					
ECTS Credits	4.00				
SWL (hr/sem)	150				
Module Level			**Semester of Delivery**		
Administering Department			**College**		
Module Leader	**Sadiq Abdel hussain**		**e-mail**		
Module Leader's Acad. Title	Prof.		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**	None	
Peer Reviewer Name			**e-mail**		
Review Committee Approval			**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 Aims **أهداف المادة الدراسية**	The course aims to: 1- Know the terms of ultraviolet rays and an introduction to these		

	rays. 2- Study the effect of these rays on some organic compounds. 3- Find the wavelength of dienes. 4- Find the wavelength and molar absorption coefficient of purines. 5- Find the wavelength of enolates. 6- Know the terminology of infrared rays and an introduction to these rays. 7- Study the effect of these rays on some organic compounds. 8- Study the spectra of alkanes. 9- Study the spectra of alkenes. .
Module Learning Outcomes **مخرجات التعلم للمادة الدراسية**	54. Organic diagnosis is considered a complement to the organic chemistry course of the previous stages, studying the interaction of light with organic matter from ultraviolet and visible spectra, infrared spectra, nuclear magnetic resonance spectra, and mass spectra, and knowing these effects.
Indicative Contents **المحتويات الإرشادية**	20. Lectures: The lectures will present the general chemical background of the measurement principles and instrumental techniques as well as theory on sampling, data processing, data analysis, quality assurance and method validation. 21. 22. Theoretical exercises: These exercises will train the students to carry out calculations on the data produced from different instrumental techniques including statistical analysis..
Learning and Teaching Strategies **استراتيجيات التعلم والتعليم**	
Strategies	

Student Workload (SWL) **الحمل الدراسي للطالب**			
Structured SWL (h/sem) **الحمل الدراسي المنتظم للطالب خلال الفصل**	64	**Structured SWL (h/w)** **الحمل الدراسي المنتظم للطالب أسبوعيا**	64

Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	68
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, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	• Present the syllabus of the current semester. • Infrared Spectroscopy: Introduction, Theory, Instrumentation, and Sample Preparation
Week 2	• Infrared Spectroscopy: C,H,O-Containing Functional Groups.
Week 3	• Effect of Ring Size Conjugation Electron-Withdrawing Groups.
Week 4	• Mass Spectrometry: Theory, Instrumentation, and Techniques
Week 5	• Isotopic Masses, Isotopic Abundances, and High-Resolution Mass Spectrometry
Week 6	• Fragmentation in EIMS: Alkanes, Alkenes, Heteroatom Compounds, Carbonyl Compounds.
Week 7	• First exam.
Week 8	• Introduction to NMR Spectroscopy: Concepts and Theory, Part 1
Week 9	• Introduction to NMR Spectroscopy: Concepts and Theory, Part 2
Week 10	• Chemical Shift. 1H NMR Chemical Shifts.
Week 11	• Chemical Equivalence and Spin-Spin Coupling.
Week 12	• UV-Vis. : Introduction, Theory, Instrumentation, and Sample Preparation
Week 13	• Valence electrons, types of translation, examples of UV-Vis.

Week 14	• Second Exam.
Week 15	• Discussion the home work.
Week 16	

Delivery Plan (Weekly Lab. Syllabus) **المنهاج الاسبوعي للمختبر**	
	Material Covered
Week 1	- The students are given chemical materials for the purpose of diagnosing them and knowing their composition, one substance every two weeks.
Week 2	- Practical, oral and theoretical tests on completed experiments
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	Exam

Learning and Teaching Resources
مصادر التعلم والتدريس

1. التشخيص الطيفي للمركبات العضوية (ج1 ،ج2) / روبرت ام . سليفراينشتاين وآخرون / ترجمة د. هادي كاظم عوض ،آخرون .
2. أطياف امتصاص الجزئيات العضوية / في .أم . بارخ / ترجمة د. عبد الحسين خضير شربة و آخرون
3. التحليل الطيفي للمركبات العضوية / مالكوم أم. كامبل / ترجمة د. سهيلة طالب حمدي .
4. التشخيص النظامي للمركبات العضوية / د . جورج يوناثان سركيس وآخرون .

5- P.Crews, J.rodriguez , M.jaspars;Organic structure analysis (1998).
.(R.Mannhold,H.kubinyi&G.Folkers ; BioNMR in durg research(2000 -6

	Text	**Available in the Library?**
Required Texts		yes
Recommended Texts		No
Websites		

APPENDIX:

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	**مقبول بقرار**	(45-49)	More work required but credit awarded
	F – Fail	**راسب**	(0-44)	Considerable amount of work required
Note:				

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	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Science for women Department of Chemistry	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Heterocyclic**			**Module Delivery**	
Module Type	B			**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code					
ECTS Credits	2.00				
SWL (hr/sem)	150				
Module Level			**Semester of Delivery**		
Administering Department			**College**		
Module Leader	**Sadiq Abdol Hussain**		**e-mail**		
Module Leader's Acad. Title	Prof.		**Module Leader's Qualification**	Ph.D	
Module Tutor			**e-mail**	None	
Peer Reviewer Name			**e-mail**		
Review Committee Approval			**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 Aims **أهداف المادة الدراسية**	1- Studying the heterocyclic compounds 2- Studying the polycyclic organic compounds 3- Studying the polycyclic organic atoms 4- Studying the biological application.
Module Learning Outcomes **مخرجات التعلم للمادة الدراسية**	55. Lectures: The lectures will present the general chemical background of the measurement principles and instrumental techniques as well as theory on sampling, data processing, data analysis, quality assurance and method validation. 56. 57. Theoretical exercises: These exercises will train the students to carry out calculations on the data produced from different instrumental techniques including statistical analysis.. 58. Enabling students to discuss and explain the importance of the environment in their lives.
Indicative Contents **المحتويات الإرشادية**	23. The course aims for the department's students to acquire information and skills that will make them able to understand heterocyclic compounds and their accompanying chemical and transformational changes to lay the necessary foundation for developing a strategy for building factories and laboratories.

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	

Student Workload (SWL)

الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	64
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	68
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, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	• Present the syllabus of the current semester. • Introduction of the cyclic and the Aromaticity
Week 2	• Oxiranes
Week 3	• Oxaziridines
Week 4	• Aziridine
Week 5	• THIETANES
Week 6	• First exam.
Week 7	• Five-member ring heterocyclic
Week 8	• 1,2-Azole
Week 9	• 1,3-Azole

Week 10	• 1,2,3-Triazoles
Week 11	• 1,2,4-Triazoles
Week 12	• Pyrylium Ion
Week 13	• Pyridine
Week 14	• Second Exam.
Week 15	• Discussion the home work.
Week 16	

Delivery Plan (Weekly Lab. Syllabus) **المنهاج الاسبوعي للمختبر**	
	Material Covered
Week 1	لايوجد عملي في هذه الماده
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources

مصادر التعلم والتدريس

"Heterocyclic Chemistry" by Raj K. Bansal 5th Edn, New Age International Publisher, ISBN 978-81-224-3143-8. 7. "Heterocyclic Chemistry" 5th Edn. by J. A. Joule, K. Mills and G. F. Smith, Wiley International Publications, ISBN: 978-1-4051-3300-5. 8. "Heterocyclic Chemistry" (3rd Edition) by Thomas. L. Gilchrist, Prentice Hall Publication, ISBN 978-0-5822-7843-1.

	Text	**Available in the Library?**
Required Texts		yes
Recommended Texts		No
Websites		

APPENDIX:

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	**مقبول بقرار**	(45-49)	More work required but credit awarded
	F – Fail	**راسب**	(0-44)	Considerable amount of work required
Note:				

NB 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.

ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي

	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Science for women Department of Chemistry	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	**Photochemistry**		**Module Delivery**	
Module Type	B		**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code				
ECTS Credits	2.00			
SWL (hr/sem)	150			
Module Level		**Semester of Delivery**		
Administering Department		**College**		
Module Leader	**Hazim Yahya**	**e-mail**		
Module Leader's Acad. Title	Prof.	**Module Leader's Qualification**	Ph.D	
Module Tutor		**e-mail**	None	
Peer Reviewer Name		**e-mail**		
Review Committee Approval		**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 Aims **أهداف المادة الدراسية**	The course aims to: 1- Studying the first laws of photochemistry, Grothus Draper, and the second law, Stark Einstein, their applications, and chemical equations. 2 - Giving mathematical examples of the Beer-Lambert law and explaining them to the students in detail. 3 - Interpretation of the regions of the spectrum and Maher's description of the extent of each region. 4 - Explaining the laws related to energy calculations and giving illustrative examples. 5 - Study of energy curves 6 - Calculating the quantity product and giving illustrative examples so that the students can understand the topic. 7 - Explaining electronic spectra and Frank-Conden's rule with diagrams for the purpose of facilitating understanding of the topic. 8 - Study the Jablonski diagram, drawing the diagram on the board and explaining the transitions. 9 - Explain the phenomena of adsorption and absorption, giving examples from reality
Module Learning Outcomes **مخرجات التعلم للمادة الدراسية**	59. Lectures: The lectures will present the general chemical background of the measurement principles and instrumental techniques as well as theory on sampling, data processing, data analysis, quality assurance and method validation. 60. 61. Theoretical exercises: These exercises will train the students to carry out calculations on the data produced from different instrumental techniques including statistical analysis.. 62. Enabling students to discuss and explain the importance of the environment in their lives.
Indicative Contents **المحتويات الإرشادية**	24. The course aims for the department's students to acquire information and skills that will make them able to understand

	industrial processes and their accompanying chemical and transformational changes to lay the necessary foundation for developing a strategy for building factories and laboratories.

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	64
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	68
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, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to photochemistry
Week 2	First law of photochemistry
Week 3	Second law of photochemistry
Week 4	Primary and secondary process
Week 5	Electromagnetic radiation
Week 6	Deference between thermal and photo process
Week 7	Beer's law
Week 8	First Exam
Week 9	Optical spectroscopic instruments
Week 10	Types of monochromators
Week 11	Radiation detectors
Week 12	Photometers
Week 13	Spectrophotometers
Week 14	Problems solution and discussion
Week 15	Second exam
Week 16	

Delivery Plan (Weekly Lab. Syllabus) **المنهاج الاسبوعي للمختبر**	
	Material Covered
Week 1	لايوجد عملي في هذه الماده
Week 2	
Week 3	
Week 4	

Week 5	
Week 6	
Week 7	

Learning and Teaching Resources
مصادر التعلم والتدريس

1 - P.W. Atkins, physical chemistry , sixth Ed. ,oxford university press, New Yourk , 2001 , p420 – m421 .
2 – J. A. Barltop and J. D . Coyle "principles of photo chemistry " John willy and sons. LTd .New yourk , 1975 , p21 .
3 – G.M.Braw , physical chemistry , fourth Ed. ,Mc Graw Hill press, 1982 , pp 762 – 773 .

	Text	Available in the Library?
Required Texts		yes
Recommended Texts		No
Websites		

APPENDIX:

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	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:

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	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Science for women Department of Chemistry	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية		
Module Title	**Quantum Chemistry**	**Module Delivery**
Module Type	C	**Theory** **Lecture** **Lab** **Tutorial** **Practical**
Module Code		
ECTS Credits	2.00	

SWL (hr/sem)	150	**Seminar**	
Module Level		**Semester of Delivery**	
Administering Department		**College**	
Module Leader	**Ayad Fahdel Mohammed**	**e-mail**	
Module Leader's Acad. Title	Prof.	**Module Leader's Qualification**	Ph.D.
Module Tutor		**e-mail**	None
Peer Reviewer Name		**e-mail**	
Review Committee Approval		**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 Aims **أهداف المادة الدراسية**	The course aims to: 1- Knowledge of applications of mathematics in physical chemistry. 2- Theoretical studies of the quantitative hypothesis. 3- Finding a link between inorganic chemistry and quantum theory. 4- Interpretation of the phenomena of emission and absorption 5- Theoretical studies of energy and motion equations. 6- A theoretical study of IR, UV, N.M.R, and E.S.R.		
Module Learning Outcomes **مخرجات التعلم للمادة الدراسية**	63. The science of quantum chemistry and spectroscopy is considered a complementary relationship to the subjects of physical and inorganic chemistry, as it deals with mathematical functions and their applications in finding objective solutions to the theoretical hypotheses that were developed to build the atom and the ionic states of atoms and molecules.		

Indicative Contents **المحتويات الإرشادية**	25. Lectures: The lectures will present the general chemical background of the measurement principles and instrumental techniques as well as theory on sampling, data processing, data analysis, quality assurance and method validation. 26. 27. Theoretical exercises: These exercises will train the students to carry out calculations on the data produced from different instrumental techniques including statistical analysis..
Learning and Teaching Strategies **استراتيجيات التعلم والتعليم**	
Strategies	

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) **الحمل الدراسي المنتظم للطالب خلال الفصل**	64	**Structured SWL (h/w)** **الحمل الدراسي المنتظم للطالب أسبوعيا**	64
Unstructured SWL (h/sem) **الحمل الدراسي غير المنتظم للطالب خلال الفصل**	68	**Unstructured SWL (h/w)** **الحمل الدراسي غير المنتظم للطالب أسبوعيا**	68
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, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	• Energy Equations
Week 2	• Study the particle function in one-dimensional + three-dimensional box.
Week 3	• Study of harmonic vibrator
Week 4	• Study of harmonic vibrator
Week 5	• Study of hard rotor function.
Week 6	• Study of hard rotor function.
Week 7	• First exam.
Week 8	• Isothermal and literary processes
Week 9	• Isothermal and literary processes
Week 10	• Study of hydrogen atom and similar ions
Week 11	• Study of hydrogen atom and similar ions
Week 12	• Study theories of approximation
Week 13	• Study theories of approximation
Week 14	• Second Exam.
Week 15	• Discussion the home work.
Week 16	

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	**لايوجد عملي في هذه الماده**
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources
مصادر التعلم والتدريس

- Quantum mechanics in chemistry" 3th edition by Hanna 1981.
- Introduction to quantum theory and atomic structure by Cox, 1996.
- Physical chemistry 5th by Walter J. Moor, 1972.

-

	Text	Available in the Library?
Required Texts		yes
Recommended Texts		No
Websites		

APPENDIX:

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	**مقبول بقرار**	(45-49)	More work required but credit awarded
	F – Fail	**راسب**	(0-44)	Considerable amount of work required
Note:				

NB 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.

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MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	**Spectroscopy**	**Module Delivery**	
Module Type	C	**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code			
ECTS Credits	2.00		
SWL (hr/sem)	150		
Module Level		**Semester of Delivery**	
Administering Department		**College**	

Module Leader	**Ayad Fahdel Mohammed**	**e-mail**	
Module Leader's Acad. Title	Prof.	**Module Leader's Qualification**	Ph.D.
Module Tutor		**e-mail**	None
Peer Reviewer Name		**e-mail**	
Review Committee Approval		**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 Aims **أهداف المادة الدراسية**	The course aims to: 1- Knowledge of applications of mathematics in physical chemistry. 2- Theoretical studies of the quantitative hypothesis. 3- Finding a link between inorganic chemistry and quantum theory. 4- Interpretation of the phenomena of emission and absorption 5- Theoretical studies of energy and motion equations. 6- A theoretical study of IR, UV, N.M.R, and E.S.R.		
Module Learning Outcomes **مخرجات التعلم للمادة الدراسية**	64. The science of quantum chemistry and spectroscopy is considered a complementary relationship to the subjects of physical and inorganic chemistry, as it deals with mathematical functions and their applications in finding objective solutions to the theoretical hypotheses that were developed to build the atom and the ionic states of atoms and molecules.		
Indicative Contents **المحتويات الإرشادية**	28. Lectures: The lectures will present the general chemical background of the measurement principles and instrumental techniques as well as theory on sampling, data processing,		

	data analysis, quality assurance and method validation. 29. 30. Theoretical exercises: These exercises will train the students to carry out calculations on the data produced from different instrumental techniques including statistical analysis..
Learning and Teaching Strategies **استراتيجيات التعلم والتعليم**	
Strategies	

Student Workload (SWL) **الحمل الدراسي للطالب**			
Structured SWL (h/sem) **الحمل الدراسي المنتظم للطالب خلال الفصل**	64	**Structured SWL (h/w)** **الحمل الدراسي المنتظم للطالب أسبوعيا**	64
Unstructured SWL (h/sem) **الحمل الدراسي غير المنتظم للطالب خلال الفصل**	68	**Unstructured SWL (h/w)** **الحمل الدراسي غير المنتظم للطالب أسبوعيا**	68
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, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) **المنهاج الاسبوعي النظري**	
	Material Covered

Week 1	• Introduction to Spectra
Week 2	• Introduction to Spectroscopy
Week 3	• Spectroscopic study of the absorption process.
Week 4	• Spectroscopic study of the emission process.
Week 5	• Spectroscopic study of the absorption and emission process and its applications .
Week 6	• Study the rotational energy of atoms and molecules.
Week 7	• First exam.
Week 8	• Study of the vibrational energy of atoms
Week 9	• Study of the vibrational energy of molecules
Week 10	• Study of the rotational and vibrational energy of atoms
Week 11	• Study of the rotational and vibrational energy molecules
Week 12	• Nuclear magnetic resonance study.
Week 13	• 8. Study of Permian electron resonance.
Week 14	• Second Exam.
Week 15	• Discussion the rotational and vibrational energy
Week 16	

Delivery Plan (Weekly Lab. Syllabus) **المنهاج الاسبوعي للمختبر**	
	Material Covered
Week 1	**لايوجد عملي في هذه الماده**
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources

مصادر التعلم والتدريس

1. أطياف امتصاص الجزئيات العضوية / في .أم . بارخ / ترجمة د. عبد الحسين خضير شربة و آخرون
2. التحليل الطيفي للمركبات العضوية / مالكوم أم. كامبل / ترجمة د. سهيلة طالب حمدي .
3. التشخيص النظامي للمركبات العضوية / د . جورج يوناثان سركيس وآخرون .

4- P.Crews, J.rodriguez , M.jaspars;Organic structure analysis (1998).

5.(R.Mannhold,H.kubinyi&G.Folkers ; BioNMR in durg research(2000 -

	Text	Available in the Library?
Required Texts		yes
Recommended Texts		No
Websites		

APPENDIX:

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Group	**Grade**	**التقدير**	**Marks (%)**	**Definition**
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