

COURSE Objectives and Outcomes

Course Number: **Chem 412**

Course Name: **Kinetic Chemistry**

Prepared by: **Ibtehag ElHassan**

Table (1): Relationship of course objectives/outcomes with PLO and ASIIN Criteria

Course Objectives:	Course Outcomes	ASIIN	PLO
<ul style="list-style-type: none"> study the kinetics of molecules 	Understand the Rate and Classification Of Chemical Reaction	b , h , a	
	Solving problem and exercises using kinetic laws		
	demonstrate theories that explain the occurrence of chemical reactions		
<ul style="list-style-type: none"> conclusion rate of reaction laws 	Understand the Rate and Classification Of Chemical Reaction	b , h	
	Apply the rate of reactions lows		
<ul style="list-style-type: none"> Measure the order of chemical reaction 	Determination of order of Chemical Reaction	b , a , d	
	Explain the graphs and the results obtained in the laboratory		
<ul style="list-style-type: none"> The complex reactions 	Discuss the mechanism of complex reaction	b , k	
	Demonstrate the ability to work effectively as apart of group ,involving leadership		
<ul style="list-style-type: none"> The effect of temperature on the rate of reaction 	Study the effect of temperature on the rate of reaction	c , l	
	Requesting that act responsibly towards colleagues		
Theories that explain the occurrence of chemical reactions	Solve problem and provide presentations and research .	h , c , l	
	Development of numerical skills		

Table (2): Methods of assessment of course syllabus

Kinetic Chemistry

Assessment Method	Number /Type	Instructor Assessed	TA/Grader Assessed	Peer/set Assessed
Midterm Exam	1	√	—	—
Quizzes	3	√	—	—
Seminar	1	√	—	—
Practical Exam	1	√	—	—
Final Exam	1	√	—	—

COURSE Objectives and Outcomes

Course Number: **Chem 222**

Course Name: **Quantum Chemistry (1)**

Prepared by: **Ibtehag ELhassan**

Table (1): Relationship of course objectives/outcomes with PLO and ASIIN Criteria

Course Objectives:	Course Outcomes	ASIIN	PLO
1.study the shortcomings of classical mechanics to explain certain phenomena	Discuss the phenomena that classical mechanics failed to interpretation.	a , b ,f	
	Development appropriate effective written and oral communication skills		
2. principle of quantization of energy	Understand the principle of quantization of energy	a , b ,	
	demonstrate the property of modern quantum wave -particle theory		
3. Planck's constant	Solve problem using appropriate ideas and techniques	h , k	
	Demonstrate the ability to work effectively as apart of group ,involving leadership		
4. The property of modern quantum wave -particle theory	Determine the wave length of particle	b , h	
	Development of numerical skills		
5. principle of uncertainty - the wave function associated with the movement of the particle	Application of The uncertainty principle	b , h, l	
	Solve problem and provide presentations and research		
6. hypotheses of quantum theory and the Schrödinger equation	Conclusion of the energy equation for the particle in a box and free particle	b , l	
	Requesting that act responsibly towards colleagues		

Table (2): Methods of assessment of course syllabus

Quantum Chemistry (1)

Assessment Method	Number /Type	Instructor Assessed	TA/Grader Assessed	Peer/set Assessed
Midterm 1 Exam	1	√	—	—
Midterm 2 Exam	1	√	—	—
Quizzes	1	√	—	—
Seminar	1	√	—	—
Final Exam	1	√	—	—

COURSE Objectives and Outcomes

Course Number: Chem424

Course Name: Nuclear and Radiation Chemistry

Prepared by: Dr. Manal Salem

Table (1): Relationship of course objectives/outcomes with PLO and ASIIN Criteria

Course Objectives:	Course Outcomes	ASIIN	PLO
studying the basics in nuclear and radiation chemistry in addition to radioactivity as well as radioactive decay and the stability of the nucleus	Recognize the definition of each :Atom – nucleus, the proton , neutron and mass number.	a,b	
	Compare between radioactive elements naturally occurring and industrially	b,c	
	Differentiate between positron decay and alpha particles.	c	
Have the knowledge of nuclear radiation measuring devices	Remember the relationship between the radioactivity and mass & the binding energy of the nucleus	a,b,m	
Studying radioactive decay and the stability of the nucleus	Recognize the interactions of radiation with material ,	a,d ,h	
Have the knowledge of radioactive sources and radioisotopes.	Illustrate the solutions to unexpected problems in creative ways.	f	
Have the knowledge of chemical induction	Use the critical and analytical thinking	g	
	Apply the skills acquired in the academic and professional contexts related to the science of chemistry.	d ,h	
	Ability to write the mathematical and statistical methods to solve problems	d ,h	
Studying the different radiation effects	Shown the ability of research work as a team and with groups	k ,m	
	Assume responsibility and individual responsibility towards society	I,m,j	
Studying the Nuclear Fission : definition, discovery - Bohr theory of nuclear fission & fission products.	Appraise how to use the modern communication technologies and information.	i,m	
Studying the Nuclear fusion: cycle (proton-proton) - the carbon cycle	Take individual responsibility and responsibility towards the community with	i,g	

	a commitment to the values and ethics that are compatible with Islamic values		
Have the knowledge of Nuclear accelerators & Neutron sources.	Ability to Participate Effective in the activities of the methodology.	h,k	
Studying the Radiation monitors and the Radioactive reagents	Interpret how to use the internet to differentiate between Radioactive reagents	a,i	

Table (2): Methods of assessment of course syllabus

Assessment Method	Number /Type	Instructor Assessed	TA/Grader Assessed	Peer/set Assessed
Homework	Homework, assignments	√		
Mid Terms/Final Exams	√ mid-term, √ Final exam	√		√
Quizzes	One biweekly	√		
Lab Assignments	-			
Computer Tools Used	One	√		
Oral Presentations	One			√
Written Reports	One	√		
Other	D ₂ L Homework ,weekly	√		

COURSE Objectives and Outcomes

Course Number: chem 411
 chemistry

Course Name: Instrumental analysis

Prepared by: Dr. Mai Makki

Table (1): Relationship of course objectives/outcomes with PLO and ASIIN Criteria

Course Objectives:	Course Outcomes	ASIIN	PLO
Identification and analysis of electrical equipment	To learn the electrolytic methods include Potentiometric , color metric and gravimetric analysis and Electrolytic.	b	
	To learn methods used in the expression of different concentrations, Equilibrium and the formation of complexes.	b	
analysis methods and Potential Calorimetric, Voltammetry and Ampirometry	Calibrations calculations for neutralization interactions , redox , sedimentation and complexes	b, h	
	Homework through the D2l program	g	
1-Identify the principles of spectrum 2-Identify the different types ,(IR,) Vis) ,(UV(of spectrum: mass and NMR Spectrum uses to identify different compounds 3-Training on practical ways for different spectrum measurements.	Describe the Methods of molecular spectroscopy.	b , h,	
	- Describe the Methods of atomic spectroscopy Differentiate between deferent types of spectrophotometer Identify different types of spectra Define the NMR spectra To use NMR spectra in the identification of compounds The distinction between different types of absorptions in infrared spectra Define the NMR spectra Can rewrite steps of using NMR in the identifications of organic compounds	b , h d	
..using virtual lap	to give more knowledge to students about	h	

	instrumental used during this course	h	
	Calculate of some absorbance values of some compounds in the UV spectrum		
Experimental work	By the of the course the student should know the various types of instruments used in chemical analysis	d, e	
	Use of Baber chromatography for separation of some chemical compounds Use of UV spectra for identification of some chemical compounds Calculate of some absorbance values of organic compounds in the UV spectrum Calculate the ph. of some compounds using ph. meter	d, e	
	applying the security and safety in the laboratory	e	

Table (2): Methods of assessment of course syllabus

Assessment Method	Number /Type	Instructor Assessed	TA/Grader Assessed	Peer/set Assessed
Homework	three to five During the term	×		
Mid Terms/Final Exams	One or two mid-term, and one final exam	×		
Quizzes	Three during the term	×		×
Lab Assignments	Weakly	×		
Oral Presentations	One	×		
Written Reports	One	×		×
Power point presentation	One	×		

COURSE Objectives and Outcomes

Course Number: chem122

Course Name: Inorganic chemistry (main group elements)

Prepared by: **Dr.Mai Makki**

Table (1): Relationship of course objectives/outcomes with PLO and ASIIN Criteria

Course Objectives:	Course Outcomes	ASIIN	PLO
This course is aimed to give a solid foundation in the areas of Inorganic chemistry	Show the main aspects of main group elements chemistry	b	
	Draw the key features of ionic and covalent compounds	b,d	
	Draw an electronic energy level diagram for the hydrogen H ₂ correctly.	b,d	
provides the students with a thorough understanding of the chemistry of s- and p-block elements	Make accurate statements about facts, concepts and relationships relating to the main group Chemistry	b	
	Use knowledge of Inorganic Chemistry to explain observations and phenomena	,h,b	
provides a detailed examination of the structure and bonding in main group and solid state compounds	Define ionization potential and electron affinity, Ionic - covalent bonds, ionic and covalent compounds, Electron - deficient compound, Electron affinity, lattice energy.	h,b	
	Describe the position of an element in the periodic table by use of the atomic number.	h,b,d	
including valence bond and molecular orbital theory for describing electronic structures and Structures of simple solids	Identify and locate s- p- block elements in the periodic table	d	
	Classify the elements into s-, p-, d-, and f-block elements according to location in the periodic table	b ,d ,h	

	State and give example of diagonal relationships in the periodic table		
This course also describe chemistry and characterization of main group element compounds.	Explain the periodicity in electro negativity- electron affinity of the elements across the table	b ,d	
	Explain the periodicity in Ionization potential of the elements across the table	b ,d	
Hydrogen and its compounds, Physical and chemical properties of hydrogen. Chemical properties of s and p block elements.	Explain the hybridization of hydrogen molecule	b,h ,d	
	Explain the chemical and physical properties of s- p-block elements		
	Using a computer as a tool in writing, drawing chemical structures and data analysis to communicate scientific information	f ,g	
	Use software and Surf internet for course contents.	f ,g	
Chemistry of boron.	Explain the chemical and physical properties of boron	d	

Table (2): Methods of assessment of course syllabus

Assessment Method	Number /Type	Instructor Assessed	TA/Grader Assessed	Peer/set Assessed
Homework	Five to six During the term	×		
Mid Terms/Final Exams	two mid-term, and one final exam	×		
Quizzes	Two during the term	×		×

Kingdom of Saudi Arabia
Ministry of Education
Majmaah University
College of Education in Zulfi
Chemistry Department

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



المملكة العربية السعودية
وزارة التعليم
جامعة المجمعة
كلية التربية بالزلفي
قسم الكيمياء

Oral Presentations	One	×		
Written Reports	One	×		×
Power point presentation	One			

COURSE Objectives and Outcomes

Course Number: CHEM 423 **Course Name:** organic chemistry (Organic Compounds Spectra)

Prepared by: Dr. Nawal Mahgoub

Table (1): Relationship of course objectives/outcomes with PLO and ASIIN Criteria

Course Objectives:	Course Outcomes	ASIIN	PLO
1-Identify the principles of spectrum 2-Identify the different types of spectrum: (UV, Vis), (mass and IR, nmr) Spectrum uses to identify organic compounds 3-Training on practical ways for different spectrum measurements	Identify the different types of spectra	b	Remembering
	Remember the properties of different types of spectrophotometers	b	
	To describe how to use UV spectra in the identifications of organic compounds	b	
	To write steps of using mass spectra in the identifications of organic compounds	b	
	Define the NMR spectra	b	
	Can listed the properties of mass spectra	b	
	Can rewrite steps of using NMR in the identifications of organic compounds	b	Applying
	Apply identification of some organic compounds using UV spectra, visible (Vis), infrared spectra IR, NMR and Mass Spectrometry	b, h	
	The distinction between different types of absorptions in infrared spectra	b	Analyzing
	Summarizes the most important properties UV spectra	b	Understanding
	Identification formulas of some unknown organic compounds from their spectrum	b, h	Remembering
	The estimated value of machinery and chemicals used in the experiments	d	
	Distribution of students into groups to conduct experiments	i, k	
	Cleaning tools before and after the experiment	d, e	
Cleanliness of the place in laboratory	d, e		

	Maintain herself and her colleagues by applying the security and safety in the laboratory	e,	
	Deal with the computer through the use of .the World Wide Web	f, g	
	Calculate of some absorbance values of organic compounds in the UV spectrum	h	Applying
	Research in the form of PowerPoint	l	
	Homework through the D2l program	g	

Table (2): Methods of assessment of course syllabus

Assessment Method	Number /Type	Instructor Assessed	TA/Grader Assessed	Peer/set Assessed
Homework	Four to five During the term	×		
Mid Terms/Final Exams	one mid-term, and one final exam	×		
Quizzes	Two during the term	×		
Lab Assignments	Weakly	×		
Oral Presentations	One	×		
Written Reports	One	×		
Other	-			

COURSE Objectives and Outcomes

Course Number:CHEM 314 **Course Name:** organic chemistry (polymers and patrol)

Prepared by:Dr.Nawal Mahgoub

Table (1): Relationship of course objectives/outcomes with PLO and ASIIN Criteria

Course Objectives:	Course Outcomes	ASIIN	PLO
1-To know that : the outline definition of the chemistry of polymer technology, and the basic principles of the polymerization process 2-To know that : the technical conditions used in the polymerization processes, 3-To know that : the physical, chemical and thermal properties of polymers. 4-To know : good idea for oil and petroleum and petrochemical industries	To identify the nature of the polymerization process	b	Remembering
	Identify technical conditions used in the polymerization processes	b	
	Identify the physical and chemical and thermal. characteristics of polymers	b	
	Remember that the physical properties of Plastic	b	
	To describe the task petrochemical industries	b	
	Define the basic compounds that make up the oil	b	Applying
	Can rewrite equations for polymer preparations under study	b	
	Apply mechanisms of polymerization operations	b	Analyzing
	The distinction between different types of polymers	b	Understanding
	Summarizes the most important phases of oil extraction	b	
	Preparation of some polymers and soap	d	
	The estimated value of machinery and .chemicals used in the experiments	d	
	Distribution of students into groups to conduct experiments	i,k	
	Cleaning tools before and after the experiment	d, e	
Cleanliness of the place in laboratory	d, e		
Deal with the computer through the use of .the World Wide Web	g		

	Calculating the ratio of outputs	f	
	Research in the form of PowerPoint	l	
	Homework through the D2l program	h	

Table (2): Methods of assessment of course syllabus

Assessment Method	Number /Type	Instructor Assessed	TA/Grader Assessed	Peer/set Assessed
Homework	Four to five during the term	×		
Mid Terms/Final Exams	one mid-term, and one final exam	×		
Quizzes	Two during the term	×		
Lab Assignments	Weakly	×		
Oral Presentations	One	×		
Written Reports	One	×		
Other				

COURSE Objectives and Outcomes

Course Number: CHEM 421

Course Name: Chemistry of Natural products

Prepared by: Amani Hassan Ahmed

Table (1): Relationship of course objectives/outcomes with PLO and ASIIN Criteria

Course Objectives:	Course Outcomes	ASIIN	PLO
What is the main purpose for this course? This course provides an introduction to the broad field of Natural Products Chemistry by reviewing the major classes of Natural Products compounds.	By the end of this course the student will be able to: Identify and characterize various classes of natural products by their structure and knows biosynthesis of the various classes of natural products	a ,b, c,	
	Draw structural and molecular and formulas of natural products compound	a ,b, c,	
	Recognize the structure of terpenes, steroids, alkaloids, flavonoids	a ,b, c,	
	Identify and solve organic chemical problems and explore new areas of research	a ,b, c,	
2- knowledge on The identification and biosynthesis of the various classes of natural products such as(terpenes, steroids , alkaloids and flavonoids)	Analyze and discuss the Information and data related to the various classes of natural products	b, c, d	
	Apply organic chemical knowledge to solve some problems.	b, c, d , f ,h	
	Use organic chemical theories to explain and predict observable phenomena, using the principles developed in organic chemistry.	b, c, d, h	
3- Acquirement skills to extraction, isolate and purify simple products that are derived from plants.	The student will follow a logical process based on well-established scientific principles and demonstrate the ability to use the appropriate problem-solving techniques to solve a scientific problem such as an various classes of natural products biosynthesis or a determination of the structure of terpenes, steroids, alkaloids, flavonoids	b ,d, e, f, h, i, k,l	
	When conducting a laboratory experiment, the student will follow written procedures commonly used in the organic lab accurately and safely. The student will maintain an accurate and organized lab notebook. When completing a lab report the	b ,d, e, f, h, i, k,l	

	student will apply the scientific method correctly by being able to state a hypothesis, take careful measurements, estimate uncertainties and draw appropriate conclusions based on gathered data and scientific principles.		
	Students will effectively and respectfully communicate and collaborate with colleagues.	k, l	
	Acquire the skill of team work.	k	
	Acquire the skill of respect colleagues	k.l	

Table (2): Methods of assessment of course syllabus

Assessment Method	Number /Type	Instructor Assessed	TA/Grader Assessed	Peer/set Assessed
Homework	Homework Assignments	*		
Mid Terms/Final Exams	Mid Terms/Final Exams	*		
Quizzes	Quizzes on bi week	*		
Lab Assignments	Lab Assignments	*		
Oral Presentations	One	*		
Written Reports	One	*		
Other	Research paper	*		

COURSE Objectives and Outcomes

Course Number: CHEM211

Course Name: Heterocyclic compounds

Prepared by: Amani Hassan Ahmed

Table (1): Relationship of course objectives/outcomes with PLO and ASIIN Criteria

Course Objectives:	Course Outcomes	ASIIN	PLO
What is the main purpose for this course? 1-Reviewing the major classes of heterocyclic compounds in terms of nomenclature, structure, properties, preparations and reactions.	By the end of this course the student will be able to: Acquire basic knowledge on classifications of Heterocyclic Compounds ,nomenclature, structural characteristics, physical properties, synthesis of Heterocyclic Compounds and chemical reactions.	a ,b, c,	
	Draw structural and molecular and formulas of Heterocyclic Compounds	a ,b, c,	
	Recognize the nomenclature, structure, physical properties synthesis and chemical reactions of Heterocyclic Compounds.	a ,b, c,	
	Use organic chemical theories to explain and predict observable phenomena, using the principles developed in organic chemistry.	a ,b, c,	
2-Knows the syntheses of several physiologically important heterocyclic compounds	Use modern instrumentation and classical techniques, to design experiments, and to properly record the results of their experiment.	b, c, d	
	Analyze and discuss the Information and data related to Heterocyclic Compounds.	b, c, d , f ,h	
	Apply organic chemical knowledge to solve some problems.	b, c, d, h	
3-Knows the proper procedures and regulations for safe handling and use of chemicals .	When conducting a laboratory experiment, the student will follow written procedures commonly used in the organic lab accurately and safely. The student will maintain an accurate and organized lab notebook. When completing a lab report the student will apply the scientific method correctly by being able to state a hypothesis, take careful measurements, estimate uncertainties and draw	b ,d, e, f, h, i, k,l	

	appropriate conclusions based on gathered data and scientific principles.		
	Students will effectively and respectfully communicate and collaborate with colleagues.	k,1	
	Acquire the skill of team work.	k,1	
	Acquire the skill of respect colleagues	k,1	

Table (2): Methods of assessment of course syllabus

Assessment Method	Number /Type	Instructor Assessed	TA/Grader Assessed	Peer/set Assessed
Homework	Homework Assignments	*		
Mid Terms/Final Exams	Mid Terms/Final Exams	*		
Quizzes	Quizzes on bi week	*		
Lab Assignments	Lab Assignments	*		
Oral Presentations	One	*		
Written Reports	One	*		
Other	Research paper	*		