



Form: Study Plan- Bachelors	Form Number	EXC-01-03-02A
	Issue Number and Date	2963/2022/24/3/2 5/12/2022
	Number and Date of Revision or Modification	2/(10/12/2023)
	Deans Council Approval Decision Number	50/2023
	The Date of the Deans Council Approval Decision	26/12/2023
	Number of Pages	08

1.	School	Science
2.	Department	Chemistry
3.	Program title (Arabic)	بكالوريوس العلوم في الكيمياء
4.	Program title (English)	Bachelor of Science in Chemistry

5. Components of Curriculum:

The curriculum for the bachelor's degree in **Bachelor of Science in Chemistry** consists of (133) credit hours distributed as follows

Number	Type of requirement	Credit hours
First	The University of Jordan	27
Second	Faculty requirements	21
Third	Specialization requirements	85
Total		133

6. Numbering System:

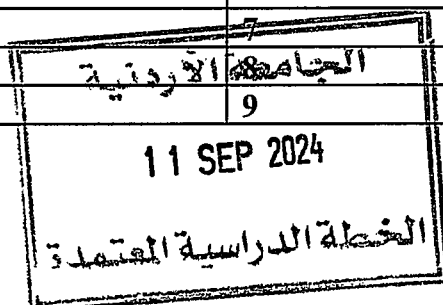
A- Department number

Department	Number
01	Mathematics
02	Physics
03	Chemistry
04	Biological Sciences
05	Geology
08	Clinical Sciences

B- Course number

Domain title	Domain number	Domain title	Domain number
General Chemistry	0	Industrial Chemistry	5
Analytical Chemistry	1	Software packages in Chemistry	6
Inorganic Chemistry	2	-	7
Organic Chemistry	3	-	8
Physical chemistry	4	Seminar	9

C- Course number consists of 7 digits





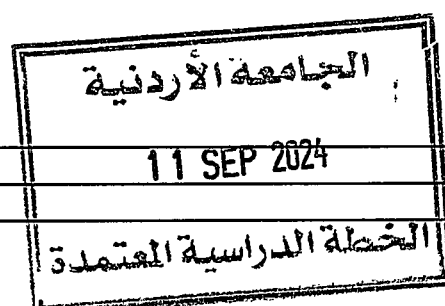
School		Department	Level		Serial number	
0	3	0	3	1	0	1

First: University Requirements:

Compulsory Requirements (18 Credit Hours)					
No.	Course Title	Course No.	Credit Hours	Prerequisites	Notes
1	Military Science	2220100	3		
2	National Culture	3400100	3		
3	Introduction to Philosophy and Critical Thinking	3400103	3	1932099, 3410100	
4	Ethics and Human Values	3400100	3		
5	Entrepreneurship Innovation	3400101	3	1932099, 3410100	
6	Life and Practical Skills	3400102	3	1932099, 3410100	

Preparation Program Requirements (0 - 15 Credit Hours)					
All students admitted to the university must apply for a degree examination in Arabic and English and the computer is prepared or approved by the university to determine their level. Based on the results of the examinations, either the student will study one or more of the requirements of the preparatory program					
No.	Course Title	Course No.	Credit Hours	Prerequisites	Notes
1	Basics of Arabic	3201099	3		Pass/Fail
2	Arabic Languages Skills	3201100	3	3201099	Pass/Fail
3	Basics of English	3202099	3		Pass/Fail
4	English Language Skills	3202100	3	3202099	Pass/Fail
5	Basics of Computing	1932099	3		Pass/Fail

Electives (9 Credit Hours)





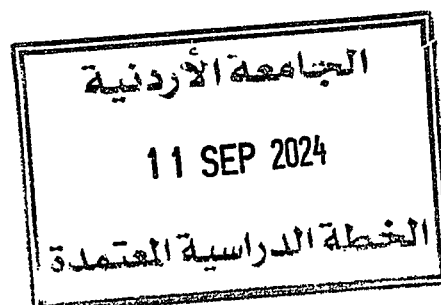
Elective courses: (9) credit hours to be chosen from the first, second and third groups mentioned below. The student has to choose one course from each of the groups.

(First Group)					
No.	Course Title	Course No.	Credit Hours	Prerequisites	Notes
1	Great Books	3400107	3		
2	Islam and Contemporary Issues	0400101	3		
3	Arab-Islamic Civilization	2300101	3		
4	Jordan: History and Civilization	2300102	3		
5	Jerusalem	3400108	3		
Electives					
(Second Group)					
No.	Course Title	Course No.	Credit Hours	Prerequisites	Notes
1	Legal Culture	1000102	3		
2	Environmental Culture	0300102	3		
3	Physical Fitness Culture	1100100	3		
4	Islamic Culture	0400102	3		
5	Health Culture	0720100	3		
6	Digital Skills	1900102	3		
Electives					
(Third Group)					
No.	Course Title	Course No.	Credit Hours	Prerequisites	Notes
1	Foreign Language	2200103	3		
2	Electronic Commerce	1600100	3		
3	Social Media	1900101	3		
4	Appreciation of Arts	2000100	3		
5	Special Subject	3400106	3		

Second: School courses: distributed as follows:

A. Obligatory school courses: (21) credit hours:

Course Number	Course Title	Contact Hours		Credit Hours	Pre-requisite
		Theoretical	Practical		
0301101	Calculus-1	3	-	3	-
0301131	Principles of Statistics	3	-	3	-
0302101	General Physics-1	3	-	3	-
0303101	General Chemistry-1	3	-	3	-
0304101	General Biology-1	3	-	3	-
0305101	General Geology-1	3	-	3	-
1900103	Modern Digital Skills	3	-	3	1932099



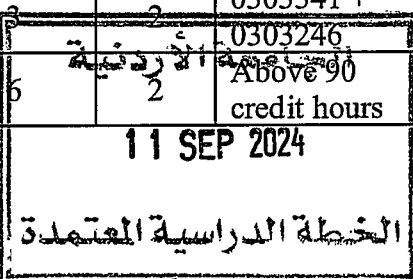
**Third: Specialty courses: (85) credit hours distributed as follows**

A. Obligatory specialty courses: (70) credit hours

B. Elective specialty courses: (15) credit hours

A. Obligatory specialty courses: (70) credit hours:

Course Number	Course Title	Contact Hours		Credit Hours	Pre-requisite
		Theoretical	Practical		
0301107	Calculus-2 for Chemistry Students	2	-	2	0301101
0302102	General Physics-2	3	-	3	0302101
0341221	Ordinary Differential Equations-1 for Chemistry Students	2	-	2	0301107
0303102	General Chemistry-2	3	-	3	0303101
0303106	Experimental General Chemistry for chemistry students	1	3	2	0303101 or concurrently 0303102
0333211	Analytical Chemistry	3	-	3	0303102
0303216	Practical Analytical Chemistry	-	3	1	0333211 0303106 +
0303221	Inorganic Chemistry-1	3	-	3	0303102
0303231	Organic Chemistry-1	3	-	3	0303102
0303232	Organic Chemistry-2	3	-	3	0303231
0303236	Experimental Organic Chemistry-1	1	4	2	0303231 + 0303106
0303241	Physical Chemistry-1	3	-	3	0303102 + 0301107
0303246	Experimental Physical Chemistry-1	1	3	2	0303241 + 0303106
0343311	Instrumental Analysis	3	-	3	0333211
0333312	Electrochemistry and Analytical	3	-	3	0333211
0303316	Instrumental analysis laboratory	0	3	1	0303216 + (0343311 or concurrently)
0303321	Inorganic Chemistry-2	3	-	3	0303221
0303322	Inorganic Chemistry-3	3	-	3	0303321
0303326	Experimental Inorganic Chemistry	1	5	3	0303106+ 0303321
0303331	Organic Chemistry 3	3	-	3	0303232
0333336	Systematic Identification of Organic Compounds	1	5	3	0303236 + 0303232
0303341	Physical Chemistry-2	3	-	3	0303241
0303342	Physical Chemistry-3	3	-	3	0341221 + 0303341
0303346	Experimental Physical Chemistry-2	1	-	2	0303341 + 0303246
0303492	Graduation Project for Chemistry Students	-	-	2	Above 90 credit hours





0303396	Employability Readiness	6	-	-	Above 90 credit hours
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B. Elective specialty courses: (15) credit hours:

Course Number	Course Title	Contact Hours		Credit Hours	Pre-requisite
		Theoretical	Practical		
0333323	Radiation and nuclear chemistry	3	-	3	0303102
0333361	Software packages in chemistry	1	3	2	0303341
0353411	Special Topics in Analytical Chemistry	3	-	3	0343311
0333412	Environmental Analytical Chemistry	3	-	3	0343311
0343421	Organometallic Chemistry	3	-	3	0303321
0353422	Special Topics in Inorganic Chemistry	3	-	3	0303322
0353431	Special Topics in Organic Chemistry	3	-	3	0303331
0353432	Introduction to Heterocyclic Chemistry	3	-	3	0303331
0333436	advanced Organic Compounds (practical)		6	3	0333336
0333441	Advanced Physical Chemistry	3	-	3	0303342
0333442	Surface Chemistry and Colloids	3	-	3	0303341
0303351	Industrial Chemistry 1	3	-	3	0303241
0333451	Industrial Chemistry 2	3	-	3	0303341
0303452	The Chemistry of Polymers	3	-	3	0303232
0303453	Materials Chemistry	3	-	3	0303341
0333433	Bioorganic chemistry	3	-	3	0303331
0344321	Biochemistry	3	3	4	0303232
0303420	Introduction to Supramolecular Chemistry	3	-	3	0303232 + 0303321
0303423	Introduction to Catalysis	3	-	3	0303321
0363455	Green Chemistry	2	-	2	0303231
0363454	Chemical Corrosion	2	-	2	0303241

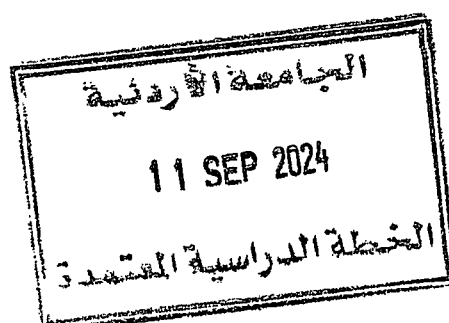
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**Fourth: Courses offered by other faculties/schools and departments**

Course Number	Course Title	Contact Hours		Credit Hours	Pre-requisite
		Theoretical	Practical		
0301101	Calculus-1	3	-	3	
0302101	General Physics-1	3	-	3	
0304101	General Biology-1	3	-	3	
0305101	General Geology-1	3	-	3	
0301131	Principles of Statistics	3	-	3	
1901102	Computer Skills for Scientific Faculties	3	-	3	1902098 or 1932099
7030110	Calculus-2 for chemistry students	2	-	2	0301101
0302102	General Physics-2	3	-	3	0302101
1221403	Ordinary Differential Equations-1 for chemistry students	2	-	2	0301107
0304321	Biochemistry	3	-	4	0303232





Fifth: Advisory Study Plan

First Year

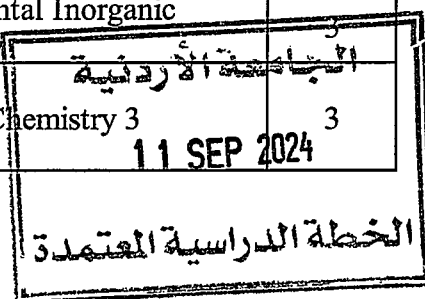
First Semester			Second Semester		
Course Number	Course Title	Credit Hours	Course Number	Course Title	Credit Hours
0301101	Calculus-1	3	0301107	Calculus-2 for Chemistry Students	2
0302101	Physics-1	3	0302102	Physics-2	3
0303101	General Chemistry-1	3	0303102	General Chemistry-2	3
	Compulsory University requisite	3	0303106	Experimental General Chemistry-1- for Chemistry Students	2
	Compulsory University requisite	3		Compulsory University requisite	3
	School requisite	3		School requisite	3
Total		18	Total		16

Second Year

First Semester			Second Semester		
Course Number	Course Title	Credit Hours	Course Number	Course Title	Credit Hours
0341221	Ordinary Differential Equations-1- for Chemistry Students	2	0303232	Organic Chemistry -2	3
0333211	Analytical Chemistry	3	0303236	Experimental Organic Chemistry-1	2
0303216	Experimental Analytical Chemistry	1	0303241	Physical Chemistry -1	3
0303221	Inorganic Chemistry -1	3	0343311	Instrumental Analysis	3
0303231	Organic Chemistry -1	3		School requisite	3
-	School requisite	3		Compulsory University requisite	3
Total		15	Total		17

Third Year

First Semester			Second Semester		
Course Number	Course Title	Credit Hours	Course Number	Course Title	Credit Hours
0303246	Experimental Physical Chemistry-1	2	0333312	Electroanalytical Chemistry	3
0303316	Instrumental Analysis Laboratory	1	0303322	Inorganic Chemistry 3	3
0303321	Inorganic Chemistry-2	3	0303326	Experimental Inorganic Chemistry	3
0333336	Systematic Identification of Organic Compounds	3	0303331	Organic Chemistry 3	3



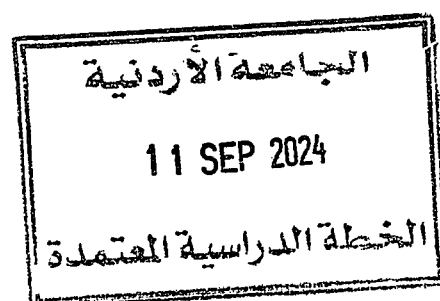


0303341	Physical Chemistry-2	3	0303346	Experimental Physical Chemistry-2	2
	Compulsory University requisite	3		Compulsory University requisite	3
Total		15	Total		17

Summer Semester		
Course Number	Course Title	Credit Hours
0303396	Employability Readiness	6
Total		6

Fourth Year

First Semester			Second Semester		
Course Number	Course Title	Credit Hours	Course Number	Course Title	Credit Hours
0303342	Physical Chemistry-3	3		Specialty Elective Requisite	3
0303492	Graduation Project for Chemistry Students	2		Specialty Elective Requisite	3
	Specialty Elective Requisite	3		Specialty Elective Requisite	3
	Specialty Elective Requisite	3		Specialty Elective Requisite	3
	Compulsory University Requisite	3		Specialty Elective Requisite	3
Total		14	Total		15



**Course Description**

0303101	General Chemistry-1	3 Credit Hours
Prerequisite: (none)		
Measurements and significant figures, chemical reactions, stoichiometry, the gaseous state, thermochemistry, electronic structure and periodicity, chemical bonding, molecular shapes, states of matter and intermolecular forces.		
0343103	General Chemistry-1 for Life Sciences	3 Credit Hours
Prerequisite: (none)		
General chemistry 1 for life sciences is an introductory course intended for first year university students from Agriculture Faculty. It covers basic topics including: the scientific method, measurements and significant figures, units and dimensional analysis, atoms, molecules, and ions, calculations with chemical formulas and equations, chemical reactions, states of matter and properties of solutions, chemical kinetics and rate of reactions, chemical equilibrium and acids and bases.		
0303102	General Chemistry-2	3 Credit Hours
Prerequisite: (0303101)		
Physical properties of solutions, Chemical kinetics, chemical equilibrium, chemical thermodynamics, acid-base equilibria in aqueous solutions, solubility and complex ion equilibria, electrochemistry.		
0343104	General Chemistry-2 for Life Sciences	3 Credit Hours
Prerequisite: (0343103)		
General chemistry 2 for life sciences is an introductory course that completes what is given in General chemistry 1 for life sciences, this class is intended for first year university students from Agriculture Faculty. This class covers basic topics including properties of gases and kinetic molecular theory, thermochemistry, quantum theory of the atom, electron configurations and periodicity, ionic and covalent bonding, molecular geometry and chemical bonding theory, thermodynamics and equilibrium and electrochemistry.		
0303106	Experimental General Chemistry for Chemistry Students	2 Credit Hours
Prerequisite: (0303101 + 0303102 or concurrently)		
The course includes experiments dealing with the following topics: safety and laboratory rules, chemical observations, stoichiometry, volumetric analysis, oxidation and reduction, colligative properties, thermochemistry, chemical kinetics, equilibrium, electrochemistry, thermodynamics.		
0333109	Experimental General Chemistry for non-Chemistry Students	1 Credit Hour
Prerequisite: (0303101 or 0343103)		
The course includes experiments dealing with the following topics: safety and laboratory rules; chemical observations; stoichiometry; volumetric analysis; oxidation and reduction; colligative properties; thermochemistry and equilibrium.		
0333211	Analytical Chemistry	3 Credit Hours
Prerequisite: (0303102)		

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The scope and importance of analytical chemistry; errors and statistical evaluation of data, equilibrium and equilibrium calculations, gravimetric analysis, volumetric analysis, precipitation titrations, complexometric titrations, acid-base titrations.

0303216	Experimental Analytical Chemistry	1 Credit Hour
Prerequisite: (0333211 or concurrently + 0303106)		
The course includes experiments dealing with the following topics: statistical treatment of data, gravimetric analysis, acid-base titrations, precipitation titrations, complexometric titrations, redox titrations, analysis of real samples.		

0303221	Inorganic Chemistry -1	3 Credit Hours
Prerequisite: (0303102)		
Fundamental particles of an atom, Bohr's theory; success in early quantum theory, an introduction to wave mechanics; atomic orbitals; quantum numbers; many-electron atoms; effective nuclear charge and Slater's rules; Hund's rule; <i>Aufbau</i> principle; ionization energies and electron affinities; Lewis bonding theory; valence bond theory (VB); molecular orbital theory (MO); octet rule and isoelectronic species; electronegativity and dipole moments; VSEPR model; stereoisomers; hybridization; structures and energies of metallic and ionic solids; packing of spheres; polymorphism in metals; alloys and intermetallic compounds; bonding in metals and semiconductors; Schottky and Frenkel defect; band theory and Fermi level; ionic lattices; lattice energy; Born-Haber cycle; Kapustinskii equation; acids, bases and ions in aqueous solution; solubility of ionic salts; energetics of dissolution of ionic salts; properties of water; Brønsted acids and bases; Hard/Soft Acid/Base Theory (HSAB); introduction to coordination complexes.		

0303231	Organic Chemistry 1	3 Credit Hours
Prerequisite: (0303102)		
Alkanes and cycloalkanes, alkenes and alkynes, conjugated alkenes, stereochemistry, common organic reactions: substitution, addition, elimination. Alcohols, ethers, conjugated systems.		

0303232	Organic Chemistry 2	3 Credit Hours
Prerequisite: (0303231)		
Introduction to organic spectroscopy, aromatic compounds, carbonyl compounds, carboxylic acids and derivatives, phenols, aryl halides.		

0333233	Organic Chemistry for non-Chemistry Students	3 Credit Hours
Prerequisite: (0303101)		
Hydrocarbons, alkanes, cycloalkanes, alkenes, alkynes, aromatic compounds, stereochemistry, halides, alcohols, phenols, ethers, amines, carbonyl compounds and carboxylic acids.		

0303236	Experimental Organic Chemistry-1	2 Credit Hours
Prerequisite: (0303231 + 0303106)		

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The course covers basic techniques used in the identification, purification and separation of organic compounds: melting point determination, distillation, crystallization, extraction, chromatography. Simple preparative experiments, qualitative tests for selected classes of organic compounds.

0303239	Experimental Organic Chemistry for non-Chemistry Students	1 Credit Hour
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Prerequisite: (0333231 or concurrently+ 0303109)

The course involves separation, purification of and identification organic compounds through their physical properties: melting point, distillation, crystallization, extraction, and chromatography. Synthesis of simple organic compounds. Identification of basic functional groups through test tube reactions.

0303241	Physical Chemistry	3 Credit Hours
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Prerequisite: (0303102 + 0301107)

Gases and kinetic molecular theory, first law of thermodynamics and thermochemistry, the second and third laws of thermodynamics, chemical equilibrium, phases and solutions, phase equilibria, solutions of electrolytes, electrochemical cells.

0303246	Experimental Physical Chemistry-1	2 Credit Hours
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Prerequisite: (0303241 + 0303106)

Selected experiments representing the following subjects in physical chemistry: Thermal chemistry, thermodynamics & chemical equilibrium, phase equilibria & colligative properties.

0343311	Instrumental Analysis	3 Credit Hours
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Prerequisite: (0333211)

Instrumental analysis and classical analysis; general components of analytical instruments; UV-VIS spectroscopy; IR spectroscopy; atomic absorption and emission spectroscopy; gas chromatography; high performance liquid chromatography; electrophoresis.

0333312	Electroanalytical Chemistry	3 Credit Hours
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Prerequisite: (0343211)

Oxidation-reduction reactions; galvanic cells; standard electrode potential; oxidation-reduction titrations; applications of redox titrations; potentiometric methods; electrogravimetry; coulometry; voltammetry; polarography.

0303316	Instrumental Analysis Laboratory	1 Credit Hour
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Prerequisite: (0343311 or concurrently + 0303216)

The course includes experiments covering the following instrumental methods of analysis: UV-VIS spectrophotometry, IR spectroscopy, atomic absorption spectroscopy, flame photometry, gas chromatography, high performance liquid chromatography, electrophoresis.

0303321	Inorganic Chemistry-2	3 Credit Hours
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Prerequisite: (0303221)

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Coordination compounds, theories of bonding: valence bond, crystal field, molecular orbital, spectroscopy, magnetic properties, selected coordination numbers, isomerism, chemical properties, introduction to organometallic chemistry.

0303322	Inorganic Chemistry-3	3 Credit Hours
Prerequisite: (0303321)		
Some aspects of molecular structure and bonding; chemistry of hydrogen; chemistry of the main group elements: IA (alkali); IIA (alkaline earth); IIIA-VIA-VIA; VIIA (halogens); VIII (noble gases); metallurgy and applications.		

0333323	Nuclear and Radiochemistry	3 Credit Hours
Prerequisite: (0303102)		
Introduction; nuclear structure and binding energy; radioactive decay processes; equations of radioactive decay and growth; interaction of radiation with matter; nuclear energy; applications in chemistry.		

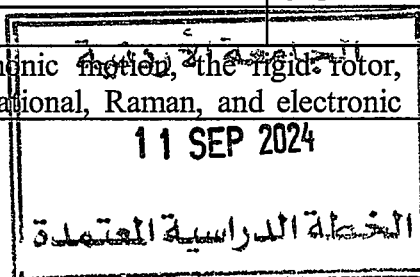
0303326	Experimental Inorganic Chemistry	3 Credit Hours
Prerequisite: (0303321 + 0303106)		
This course focuses on the preparation and characterization of coordination complexes using various ligands. The course also includes a series of lectures that delve into the theoretical aspects of inorganic synthesis and structure elucidation. Upon successful completion of this course, students will be able to independently conduct the experimental preparation of coordination complexes. Additionally, students will gain proficiency in characterizing these complexes through techniques such as melting point determination, molecular weight analysis, room temperature magnetic measurements, conductance studies, and spectral analysis (including FTIR and UV)		

0303331	Organic Chemistry 3	3 Credit Hours
Prerequisite: (0303232)		
Chemistry of α -carbon of carbonyl compounds, α -dicarbonyl compounds and amines. Chemistry of biologically important organic compounds: carbohydrates; lipids; amino acids and proteins; nucleic acids.		

0333336	Systematic Identification of Organic Compounds	3 Credit Hours
Prerequisite: (0303232 + 0303236)		
Multistep syntheses; classification tests for functional groups; identification of unknown organic compounds by physical, chemical and spectroscopic techniques, and by the preparation of derivatives. The course also includes a series of lectures related to the theoretical aspects of the experimental part.		

0303341	Physical Chemistry-2	3 Credit Hours
Prerequisite: (0303241)		
Solution of electrolytes and Debye-Hückel theory, electrochemical cells, kinetics of elementary reactions, composite reaction mechanisms, surface chemistry, transport properties.		

0303342	Physical Chemistry-3	3 Credit Hours
Prerequisite: (0341221 + 0303341)		
Basic principles of quantum chemistry. Simple harmonic motion, the rigid rotor, atomic & molecular structure. Basic principle of vibrational, rotational, Raman, and electronic spectra of		





molecules. Chemical bond: Molecular orbital theory & LCAO (linear combination of atomic orbitals) theory. Statistical thermodynamics.

0303346	Experimental Physical Chemistry-2	3 Credit Hours
Prerequisite: (0303246 + 0303341)		
Selected experiments representing the following subjects in physical chemistry: Ionic activity, electrical conductivity, electrochemical properties, surface chemistry, electromagnetic spectra, chemical reactions kinetics.		

0303351	Industrial Chemistry 1	3 Credit Hours
Prerequisite: (0303241)		
Basic consideration, characteristics of the chemical industry, material and energy balance, raw materials for chemical industry, production processes for organic chemical industries, basic chemicals from petroleum, industrial polymers, detergents, chemical industrial process development, technology of chemical processes, selected industrial processes.		

0333361	Software Packages in Chemistry	2 Credit Hours
Prerequisite: (0303341)		
Software for chemical education; statistics of chemistry; interactive training in analytical chemistry; regression analysis; computational thermochemistry; reaction kinetics molecular modelling.		

0353411	Special topics in Analytical Chemistry	3 Credit Hours
Prerequisite: (0343311)		
Water quality, chemistry of the environment, pharmaceutical analytical applications.		

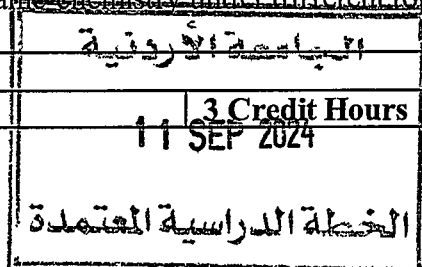
0333412	Environmental Analytical Chemistry	3 Credit Hours
Prerequisite: (0343311)		
This course is pivoted at analysis of the environment; analysis of major and minor constituents in air, water, earth and living matter; sampling strategies.		

0343421	Organometallic Chemistry	3 Credit Hours
Prerequisite: (0303321)		
Organometallic chemistry of the main group elements, and d-block transition metals; metal carbonyls, nitrosyls, alkyls, carbenes; carbynes, carbides, alkenes, alkynes and metallocene; organometallic compounds: reactions, mechanisms, catalysis		

0353422	Special Topics in Inorganic Chemistry	3 Credit Hours
Prerequisite: (0303322)		
This course will be taught by a staff member in the field of inorganic chemistry under different topics according to each staff member.		

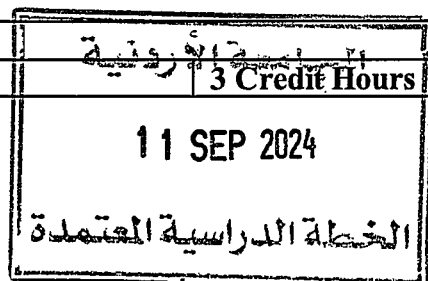
0353431	Special Topics in Organic Chemistry	3 Credit Hours
Prerequisite: (0303331)		
This course will be taught by a staff member in the field of organic chemistry under different topics according to each staff member.		

0353432	Introduction to Heterocyclic Chemistry	3 Credit Hours
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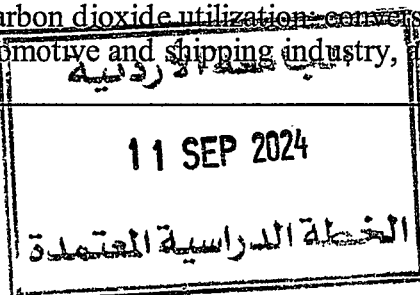


Prerequisite: (0303331)		
Synthesis and reactions of the following classes of heterocycles: saturated heterocycles containing one heteroatom (N, O or S); heteroaromatics: furan, thiophene, pyrrole, pyridine, quinoline and iso-quinoline; indole; nomenclature of condensed heteroaromatics; natural occurrence and biological activity of heterocyclic compounds.		
0353436	Advanced Experimental Organic Chemistry	3 Credit Hours
Prerequisite: (0333336)		
Multi step synthesis of some organic compounds using named synthetic reaction, and confirmation of their chemical structures by different spectroscopic techniques. The course also includes submission of a final report summarizing the methods, results, discussion, and documentation.		
0333441	Advanced Physical Chemistry	3 Credit Hours
Prerequisite: (0303342)		
Statistical thermodynamics; electrical, thermal and optical properties of solids; the liquid state: liquids compared with gases and solids, theories and models of liquids, water the incomparable liquid; some modern techniques of spectroscopy; applications.		
0333442	Colloid and Surface Chemistry	3 Credit Hours
Prerequisite: (0303341)		
Introduction to colloid and surface chemistry; system stability; instruments used in colloid and surface chemistry; sedimentation and diffusion; viscosity; surface tension; and light scattering; colloidal structure in surfactant solution; emulsions and microemulsions and their applications.		
0333451	Industrial Chemistry 2	3 Credit Hours
Prerequisite: (0303341)		
Industrial chemical kinetics, industrial catalysis and catalysts, industrial separation processes, production processes for inorganic chemical industries, the chemical industry and large-scale chemical manufacturing, the salts industry, sources of chemicals other than natural gas and petroleum.		
0303452	Polymer Chemistry	3 Credit Hours
Prerequisite: (0303331)		
Classification and nomenclature of polymers; polymer structure and physical properties, methods of molecular weight determination, polymers in solution and viscosity of dilute polymer solutions, step reaction polymerization, chain reaction polymerization, copolymerization, technology of polymerization processes.		
0303453	Materials Chemistry	3 Credit Hours
Prerequisite: (0303341)		
This is an introductory course covers the historical and definition of materials and chemistry, fabrications, Crystalline and amorphous solids which includes bonding in solids (Ionic, covalent, metallic, molecular) electrical structure, physical and structural properties, phase diagram and band theory.		
0333433	Bioorganic Chemistry	3 Credit Hours





Prerequisite: (0303232)		
The course covers topics of current interest in bioorganic chemistry. Catalysis in organic Reactions. The organic chemistry of coenzymes, compounds derived from vitamins. The organic Chemistry of metabolic pathways. The organic chemistry of drugs, discovery and design. enzyme models.		
0344321	Biochemistry	3 Credit Hours
Prerequisite: (0303232)		
A detailed discussion of the chemistry of water, acids, bases and buffers. Basic techniques to purify macromolecules especially. Proteins. Structural organization and building blocks of proteins. Enzymes: their classification, function and kinetics. Regulation of enzyme activity. An overview of carbohydrates and lipids.		
0303492	Graduation Project for Chemistry Students	2 Credit Hours
Prerequisite: Above 90 credit hours		
Graduation project leading to BSc. degree, arranged between the student and a faculty member. A problem is assigned to the student in one of the different chemistry tracks. Students are asked to rely on them self to find a solution (practical or theoretical) to their assigned problem. Students are expected to develop exploratory and independent work skills, practice according to schedules for completing projects, and be able to explain and present their findings in a professional manner.		
0303423	Introduction to Catalysis	3 Credit Hours
Prerequisite: (0303321)		
The course thoroughly covers the subjects of catalysis and catalytic processes, including: historical milestones in the development of catalysis; kinetic models and rate equations of catalytic processes; laboratory and industrial catalytic reactors; bioreactors; examples from the industry for catalytic processes; future overview on developments in catalysis.		
0303420	Introduction to Supramolecular Chemistry	3 Credit Hours
Prerequisite: (0303232 + 0303321)		
Non-covalent interactions, chelate and macrocyclic effects, characterizing supramolecular systems, solvent effect; Cation binding; Anion binding; Simultaneous cation and anion binding; Neutral guest binding; Self-assembly; Applications		
0363454	Chemical Corrosion	2 Credit Hours
Prerequisite: (0303241)		
Introduction and definition of corrosion, Corrosion thermodynamics, Corrosion current, Corrosion potential, Kinetics of corrosion, Inertness of metals, Common examples of corrosion, Chemical and electrical needs for corrosion prohibition, Corrosion inhibitors.		
0363455	Green Chemistry	2 Credit Hours
Prerequisite: (0303231)		
Green chemistry solutions will be discussed within the fields of Chemical production: choice of feedstock, solvents, catalysts, synthesis routes including microwave and ultrasonic assisted synthesis; Chemical energy storage and conversion: chemical energy carriers, synthesis routes for alternative fuels including electrofuels and hydrogen; Carbon dioxide utilization: conversion routes to chemicals and fuels; Emission control: chemical, automotive and shipping industry, Adsorption, ion-exchange and catalytic methods.		





0303396	Employability Readiness	6 Credit Hours
Prerequisite: Above 90 credit hours		
<p>Employability Readiness in the Chemistry Department is a fundamental part of its academic program. It is organized based on the university's and the college's mission and general objectives, which aim to achieve the highest levels of quality in the development of educational, scientific, and knowledge processes. This is done in collaboration with relevant community institutions, ensuring that the training is grounded in the practical realities of various fields of science and knowledge. The training provides students with the opportunity to integrate and understand the nature of the job market during their theoretical academic studies. It allows them to acquire important practical skills in their chemical specialties, including adherence to work values, fostering creativity, and working within a team. These skills offer them early experiences that ease their entry into the job market without placing an additional burden on employers.</p>		

