Chemistry plan +summary (5) 13/7/1435.

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بسم الله الرحمن الرحيم

Introduction

Establishing a new academic program or making amendments for an ongoing academic program is considered a complex process, containing a lot of effective factors that must be taken into account.

Perhaps among the elements which are the most important are scientific value and qualitative addition that can be added by this program to the community and work as well as the surrounding environment where the interaction of program outcomes of high professional staff members and scientific knowledge with the academic environment show us the importance of these outcomes and of putting them among the priorities of the program to be introduced.

When other effective elements - such as well studied academic plan, the correspondence of national and international standards, qualified staff with precise and necessary experiences , the study of the labor market, and the existence of different educational resources- are available, this will contribute significantly to set up an academic program to achieve the desired goals.

Like any academic program aspiring to improvement and reflecting the educational process , there should be a clear strategy for self-assessment through the quality criteria of all components of the program, including teaching, exams , the study plan , the course description, educational management and others, as a comprehensive and constant evaluation which aim to use feedback for development and Improvement.

The programs administrators should have a clear vision, future improvement strategy, and educational system to deal with the changes and interact with them for making changes and constructive amendments to serve the academic process, and improve outcomes.

The request for an establishment or modification for the academic program, which is presented now, aims at collecting and organizing the data required for establishing the academic program and completion of its elements. The proposal has been divided into ten main parts:

Part I: **Specification of the academic program**.

Part II: **Importance of the program**.

Part III: **The program's relationship with other programs within the department and the college**.

Part IV: **the Study Plan of the program**.

Part V: **The program specification and the courses description**.

Part VI: **The program implementation requirements**.

Part VII: **The tools and sources of teaching and learning**.

Part VIII: **The Future Strategic Plan for the program**.

Part IX: **Quality Requirements**

.**Part X**: **Accreditation of the program**

Majmaah university

The vice deanship for educational affairs وكالة الشؤون التعليمية

The constant committee for plans and educational system

سعادة: .....

The subject: request establishing program program modification

I submit the request of academic program creation according to the following basic information

B.A in education– Chemistry	**program name**
Chem	**program : code**
chemistry	**the department name**
College of education in Zulfi	**college**
Riyadh	**the region**
Zulfi	**district**

معلومات مقدم الطلب

Chemistry	**The academic department**	**Dr. Jihan Abd Aziz Omiri**	**The applicant's name**
Assistant professor	**Academic rank**	**PhD**	**the degree**
٠٥٥٩٣٥١٨٩٩	**Mobile**	**Supervisor**	**Rank**
g.alomayri@mu.edu.sa			**Email**

	Email

Notice that the information contained in the application has been discussed in the department session No. (6) on 22/6/5143 H and it was recommended by the College council to establish a new academic program, which approved the program on the session (No (31) on 7 / 6/1435. The required documents which have been submitted are correct. So, I sign

Signature of Applicant:

As well .. Do not fill in the information below

The application has been submitted to : ---------- ---

Ranked: ---------- ---

Dated: / / 143, corresponding to: / / 201 m

Recipient Name: ---------- signature: ---- ----

Guidelines

Introduction:

The submission of an application for establishing or modifying an academic program is a precise process which requires filling out a lot of correct information, so we hope that you read carefully the terms of the form and fill out the information carefully, as we hope you avoid unjustified verbosity in information**.**

So before you start filling out the form we hope to collect the necessary information that will help you complete this application with ease and accuracy, and the most important**:**

1 . Information relating to the program's objectives, and vision, and future plan**.**

2 . Components of the program, and infrastructure**.**

٣. The teaching and administrative staff**.**

٤. Study Plan and its components**.**

٥. Study of the feasibility of establishing or modifying the program (causes for establishing the program and its economic impacts on society and the areas where the graduates can work**.**

Terms of submission of the application:

١..Filling out the information completely in attached forms , and in the case of not being able to fill certain information, contact Agency President for Academic Affairs- programs administration and study plans (T / 064 041 055, F / 064 041 066) to ask for help.

٢. Submitting all documents, and data required for the application.

٣. The information listed is to be accurate and clear.

٤. Filling out the application electronically, and printing it out, then it should be signed, and delivered by hand according to the instructions provided.

Documents required:

when submitting this application, the following documents should be submitted :

١.The program specification form according to the National Commission for Academic Accreditation, and evaluation according to the instruction language approved in the department.

٢. The course description of the plan, according to the instruction language approved in the department.

٣. The Minutes of the department sessions for the study plan and the committee tasked to the modification or creation of the study plan.

٤.The Minutes of the sessions of the department and college which include the approval , recognition, and the recommendation to develop study plan.

٥.The evidence shows the procedures that have been taken before preparing for the study plan (addressing the labor market, workshops, or sessions, and meetings with community, alumni, and faculty members.

٦. Evidence shows mechanisms for choosing references, which are to be followed.

٧. Correspondences and refereeing mechanisms that have been followed for evaluating the study plan.

٨..Any evidence, or remarks to suggest the quality of the study plan, and consistency with national and international standards.

Note: The information in the documents should be submitted with the application, presumably processed firstly in order to help you fill out an application for establishment of the program.

Mechanism for Filling out the application.

١.Filling out the application electronically.

٢. Printing out the application one side clearly.

٣. Submitting three copies of the application, and one copy of the required documents.

٤.The documents are included in the last part of the application, and are remarked when filling out the application in the specified box.

٥. If there are other documents, they can be included and are remarked when filling out the application in the specified box.

Form of establishing an academic program

College الكلية
Introduction College of Education in Zulfi was founded in February / 1413 under the name of (the girls' college in Zulfi) and it grants the two-year diploma for the purpose of teaching at elementary school. It included the following sections: Department of Arabic Language& Social Sciences, and Department of the Holy Quran & Islamic Studies, the Department of Sciences & Mathematics, and the Department of Home Economics & Art Education. It was under the supervision of the General Presidency for Girls' Education at that time. In 1421, his Excellency the General chairman of Girls' Education Sheikh Abdul Malik bin Dheesh issued a decision on developing (two- year college) College and changing its name to: (College of Education for Girls), for the purpose of granting the degree of bachelor of teaching intermediate and secondary phases. It was approved the opening up of five departments: The Department of Physics, Department of Arabic language, the Department of Chemistry, Department of Mathematics, and the Department of Home Economics. In 1422, the Department of Islamic Studies was opened , and the departments which granted two-year diplomas were closed, they are four departments: the Department of Arabic Language & Social Sciences, and the Department of the Holy Quran & Islamic Studies, the Department of Sciences & Mathematics, and the Department of Home Economics & Art Education. Then, The department of computer was opened . On June 1428, the college was joined to the university of Princess Noura (formerly the University of Riyadh). In the year 1430, the college was joined to King Saud University which was under its supervision on distance. On 3 Ramadan 1430, corresponding to August 2009, 24, Royal Decree No. (7305 / m b) was issued by the Custodian of the Two Holy Mosques King Abdullah bin Abdulaziz Al Saud, Chairman of the Council of Ministers and Chairman of the Higher Education Council - may Allah protect him - to approve on establishing three other universities in: Dammam city , Al-Kharj province, and the Shaqraa province. Under this decision, nine colleges were established. The College of Education in Zulfi was among the colleges that had the honor of being mentioned in this Royal Decree. Therefore, its name was

changed to (College of Education in Zulfi) to include males and females.	
:**College vision** **Pedagogical , and academic and professional excellence in building a knowledge society**.	
The college mission **The college mission**: The College seeks to prepare educators, academics, professionals who are qualified to compete in building a knowledge society in accordance with the quality criteria.	
Admission requirements	
1.The applicant should have a secondary school diploma, or its equivalent from the Saudi Arabia, or from outside	١
2.The applicant should not exceed more than five years since he/she gets a secondary school diploma or its equivalent (The University Council can except this requirement if there are convincing reasons)	٢
3.Be of good conduct.	٣
4.Be medically fit, and successfully pass any test or a personal interview which the College decides.	٤
5.To get approval from the institution– whether private or governmental– where he works	٥
6.Any other conditions specified by the University Council should be met at the time of submission.	٦
the training requirements : :	
1.Passing 120 credit hours .	١
	٢

2.Student is committed to regulations of the field training(the list of field education)	
3.Student makes practical use of training (for one complete semester) يطبق **as stated in the regulations of the course plan.**	٣
Graduation requirements in the college	
1.Student graduates after completing the graduation requirements successfully according to the study plan, with estimate at least "pass" (i.e the minimum accumulative average is 2 out of 5. The college council based on the recommendation of the department concerned can recalculate GPA in case of student's success in the courses, and his fail in the accumulative average. This is done by determining appropriate courses which the student is to take to raise the accumulative average, according to the following rules decisions: **A. The total of the course units which are excluded from the accumulative average should not exceed 15% of the total units of the curricula of student plan.** **B. When the accumulative average is recalculated, estimates fail (f), deprived (h), and withdrawn (s) are excluded.** **C. The GPA shouldn't not exceed 2 out of 5 after recalculation.** **D. academic record must include all estimates of the courses taken by the student and estimates that she got every time.** **E. The transcripts should include all estimates of the courses which a student has taken as well as the estimates that he got each semester.**	١
The student is not considered a graduate but after the issuance of approval of granting her the degree from the university council.	٢
	٣

The deanship of registration and admission submits to the university council, or the committees authorized, graduation cards in order to be presented at the earliest session after the end of final exams, and posting grades. The cards can also be submitted individually for the students' cases with incomplete estimate (I), or who were not allowed to have an alternative exam for the course or more at the end of the academic level of the program of graduation or the like when completing graduation requirements. The last semester of the student's record is considered the semester of graduation.	
4. Each graduate is given a certificate (graduation document) in Arabic and English which illustrates the following information: Graduation date (Hijri and Gregorian), the full name of student, nationality, the national number, college, specialization, the track if any, scientific degree , estimate , and honors, if any. The document is signed and sealed by the Dean of registration and admission. The certificate can be issued in case of missing it, with a notice placed "issue in a lieu of a lost one"	٤

The college departments, the academic programs, and scientific degrees which are granted by the college.

	The degree	The academic program in the department	Academic department	
١	B.A in education–chemistry	chemistry	chemistry	
٢	B.A in education–Islamic studies	Islamic studies	Islamic studies	
٣	B.A in Education–Arabic language	Arabic language	Arabic language	
٤	B.A in Education–Physics	physics	Physics	
٥	B.A in education–Mathematics	mathematics	mathematics	
٦	B.A in education–English Language	English Language	English language	

First: The program identification أولاً: التعريف بالبرنامج:

1.The program name	Islamic studies		
The program code	CHEM	The program No	٥
1.The college name	College of education in Zulfi		
1.The scientific qualification granted by the department:	*B.A in education–chemistry*	The total of credit hours required for the completion of the program	*(144) credit hours*
1.district	Riyadh	2.the region:	
1.The starting date of the new program	The semester	day	month	year
	first		١٠	١٤٣٢هـ/ ١٤٣٣هـ

Information is filled out under item 9 and 10 only for the continuing modified program

9.. If the program is in progress, the period during which the modified program is used.	Six semesters of study
10.What is the institution which evaluated the –	College of Education in Zulfi

/ Department of Chemistry	ongoing program and what are the amendments which have been recommended?
The department supervisor : Dr. Jihan Abdel-Aziz al-Amiri	11.What is the name of person responsible for the program and the rank this person has?

Second: Importance of the program	
1.Objectives of the program	
1.Commitment to outstanding academic level in undergraduate and graduate programs	.١
2. The continuing development of the curricula	.٢
3.Contributing to dissemination of scientific culture through holding scientific seminars and conferences.	.٣
4.Raising awareness in the field of chemistry via environmental and social partnership.	.٤
5.Setting up scientific specialized skills in the field of chemistry that contribute to community service, programs, and development plans in the areas of education, health, industry, and scientific research.	.٥
6.Contributing to scientific and cognitive progress through the academic and scientific research.	.٦
7.Improving the performance of faculty members through training courses, seminars and scientific conferences.	.٧
8.Attracting academically outstanding students.	.٨
1.The program vision	
Seeking to enhance a learning environment which is characterized with the quality of teaching, scientific research, and community service, according to the international quality criteria.	
The program mission	

The department seeks to provide qualitative education that combines knowledge and innovation, with preparing for a staff of scientists and researchers who are able to meet the needs of the labor market in accordance with the quality criteria

Objectives:

1. developing the chemistry labs, and using the latest techniques with them.
2. establishing an advanced research laboratory for the purpose of participating in the local and international scientific research projects.
3. Providing high-quality academic programs, headed by local and international standards and are consistent with Islamic values.
4. Preparation of distinctive cadres who are capable of tender, creativity, and meeting the needs of the community.
5. Raising the efficiency of teaching staff with continuing training .
6. Dissemination of science and knowledge among students.
7. Graduating a new generation of chemists who have a high degree of competence in the field of education and scientific research. Also, they are trained on various scientific methods in the areas of chemistry and able to serve the community.
٨. Domestic and international competition, aiming to reach the ranks of leading departments.

4.. Justifications for making (an amendment) for the program (please write the basic justifications).

1.The unavailability of approved plan for the department.	١
2.Correlating the study plan with the vision , mission , objectives of the program and with the labor market requirements.	٢

5.What are the expected need for the labor market for graduates of this department?

☐ **Very significant**	☐ **significant**	☐ **average**	☑ **normal**

6–What are the expected outcomes that graduates are expected to gain after completing this program? –	
1.The ability to discuss problems related to the science of chemistry, and to find innovative solutions. .	.١
2.Full readiness to cooperate with others in the projects, and joint initiatives.	.٢
3.Familiar with the field, and integrated with the knowledge .Also, having skills required in the field of teaching chemistry	.٣
4.Behaving in ways which are consistent with the values and Islamic beliefs as well as reflect the high levels of dedication and responsibility.	.٤
5.Application of the theoretical perceptions and methods of acquired investigation in Chemistry in addressing different issues and problems .	.٥
6.Realizing rapid changes in the chemical information, and the ability to take that into account when studying academic or professional issues and to propose solutions to them.	.٦
7.Participating in activities in order to keep abreast of the latest developments in the field of chemistry and enhancing the knowledge of students as well as strengthening their confidence in themselves.	.٧
8.Readiness to identify problems, issues, and to find solutions to them individually or with the team .	.٨
	.٩

10.Ability to identify appropriate mathematical and statistical methods and to use them in the analysis.	.١٠
11.The ability to choose the most suitable mechanisms and to use them in showing the results to the recipients.	.١١
12.To express the spirit of leadership in academic, professional, and social fields.	.١٢
7.What are the expected outcomes of learning according to the National Commission for Academic Accreditation and assessment? (Read the guidelines for help)	
A.characterictics .A Identify a comprehensive range of acquaintances in the science of chemistry, and related science.	
1.Providing students with an integrated, chemical and organized culture.	.١
2.Providing students with a comprehensive knowledge of the principles of chemistry and its theories.	.٢
3.Students' eruditeness about the role of Arab Muslims scholars in the progress of chemistry	.٣
4.Understanding the fundamentals of chemical industries	.٤
5.Familiarity with internationally used terms and symbols of chemistry.	.٥
6.Knowledge of other professional areas and natural phenomena as well as how to exploit them in the development in the Kingdom of Saudi Arabia.	.٦
7.Training students to use chemical devices.	.٧
8.Training students to solve chemical problems exercises and issues	.٨

as well as the use of books, reference, and scientific journals.	
9.Having broad knowledge of scientific reports by training students to write appropriately and accurately.	.٩
10.Realizing that chemistry is not a separate science from others.	.١٠
11.Learning about the latest developments in the field of chemistry through familiarizing with modern related scientific research and about solutions.	.١١
12.Knowing the systems, regulations , and technical requirements of profession. In addition to knowing how to improve them over time in response to changes in ambient conditions.	.١٢
أ- المهارات الإدراكية: **b. Cognitive skills**	
-The results should be applied to a wide range of issues and problems with some guidance. **-To be able to use usual procedural methods (routine) - appropriately, with identifying situations that require innovative solutions, and responding to these situations based on the theoretical background, and process-related.**	.١
2.To apply ethical and academic standards in teaching, research, and to report experimental results.	.٢
3.To understand the information, concepts and new evidence, and to be evaluated using a variety of sources.	.٣
4.To test hypotheses by selecting a structured model and design, or to conduct experiments with observations being recorded correctly, and with data being interpreted data using appropriate tools.	.٤
5.To create a safe and effective working environment in scientific and field laboratories in closed places.	.٥
6.To examine relatively complex problems, using a variety of	.٦

forms of information technology and other sources.	
7.To propose innovative solutions to problems, taking into account the theoretical knowledge, relevant professional experience and the consequent decisions taken.	.٧
8.To apply skills, and perceptions in academic and professional contexts related to science of chemistry.	.٨
T.Interpersonal skills and responsibility	
1.To facilitate constructive solutions to issues in collective attitudes, either as a leader or as a member of a group.	.١
2.To exercise the leadership of groups in a variety of positions requiring innovative responses.	.٢
3.To deal with ethical and professional issues that are related to values and moral judgments in ways that are sensitive to others and are compatible with the core values and professional ethics identified	.٣
4.To bear the responsibility of self-learning.	.٤
5.To determine the means of finding new information or necessary analysis methods, and to use them to accomplish the tasks assigned.	.٥
6.To be ready to identify issues that require special attention, and address them appropriately, whether individually or through collective work.	.٦
B-communication skills, information technology, and numerical skills	
1.Oral and written communication effectively. The program courses include a lot of things that help develop students' skills in speech, including the use of some forms of effective presentation and other means of information technology.	.١
2.The use of communications and information technology	.٢

–Students can develop these skills by doing the required homework , by referring to the electronic information sources, or by applying some of the e–learning programs	
3.Students' contact with the staff members, or during the field work, or via a lot of modern methods such as the World Wide Web.	.٣
ب– المهارات النفسية والحركية: **C– the psychological and motor skills)**	
1.Students measure all the chemical variables of laboratory experiments accurately and carefully.	.١
2.Students select the appropriate chemical tools which are needed for experiments.	.٢
To what extent is the program connected to the University's vision ?	
There is a significant correlation between vision of the program and that of the college which both, in turn, are associated with the university vision. The program seeks to prepare graduates, having the ability to contribute in Saudi society greatly, according to the quality criteria and academic accreditation which are recognized locally and internationally. The program also seeks to enjoy a privileged position in scientific research and technological progress.	
1.What are the expected employers for graduates?	
1.Higher education	.١
2.Education	.٢
3.Research centers	.٣
The program seeks to open up other work institutions, such as:	
1.Medical laboratories	.١
2.Hospitals	.٢
3.Water factories	.٣

Third. The program's relationship with other programs in the department and college

1.What are programs that are taught in the department or college, and the ones related to the program established or modified?

اسم البرنامج **The program name**	القسم الأكاديمي أو الكلية **The academic department or college**	عـــدد الســـاعات المعتمدة **The number of credit hours**	النسبة المئوية (٪) **Percentage %**
	لا يوجد **None**		

١- ما نسب إنجاز الخطة الدراسية للبرنامج من قبل الجامعة والكلية والقسم؟

2-What is percentage of the completion of the study plan for the program by the university , the college and the department?

الجهة	نسبة الإنجاز (٪) **Percentage of achievement**	عدد الساعات المعتمدة **The number of credit hours**
الجامعة **university** **university**	٪٨,٣٣	١٢
الكلية **college**	٪٢٢,٢٢	٣٢
القسم **department**	٪٦٩,٤٤	١٠٠
أخرى(يرجى ذكرها) **other**	لا يوجد **none**	
المجموع النهائي **Total**	٪١٠٠	١٤٤ ساعة

٢- ما المسارات،أو التخصصات الفرعية المتاحة في البرنامج؟ لا يوجد

2–What are minor majors available in the program? None

رابعا: الخطة الدراسية للبرنامج:

Fourth: The study plan of the program:

١- المتطلبات الإجبارية والاختيارية:

Compulsory and elective requirements

متطلب **requirement**	نوع المتطلب **Type of requirement**	مجموع الساعات المعتمدة **Number of credit hours**	النسبة المئوية من مجموع ساعات الخطة الدراسية **The percentage of the total credit hours out of the study plan**
جامعة **university**	إجباري **compulsory**	١٢*	٨,٣٣٪ *
	اختياري **Elective**	٢٤	
كلية **college**	إجباري **compulsory**	٣٢*	٢٢,٢٢٪ *
	اختياري **Elective**	لايوجد **none**	لايوجد **none**
قسم **department**	إجباري **compulsory**	١٠٠*	٦٩,٤٤٪ *
	اختياري **Elective**	لايوجد	لايوجد **none**
مقررات حرة: (خارج الخطة، وبمعدل ٦ ساعات معتمدة على الأكثر) **University electives (6 credit hours maximum)**		لايوجد **none**	لايوجد **none**
المجموع الكلي للساعات، والنسب **The total number of hours and percent**		١٤٤*	١٠٠٪*

٢- متطلبات السنة التحضيرية * لا يوجد **none** **2. preparatory year requirement**

(لا تحتسب متطلبات السنة التحضيرية ضمن الساعات المعتمدة للبرنامج الأكاديمي) .

The preparatory year requirements : none

(**Preparatory year requirements are not included within the credit hours for the academic program**)

٣- متطلبات الجامعة :**university requirements**			
رقم المقرر	رمز المقرر **code**	اسم المقرر **Course name**	عدد الساعات المعتمدة **Credit hours**
101	**ARAB**	المهارات اللغوية Arabic language skills	٢
101	**SOCI**	قضايا مجتمعية معاصرة Contemporary Social Issues	٢
101	**ENT**	ريادة الأعمال Business Leadership	٢
101	**FCH**	الأسرة والطفولة Family and Childhood	٢
101	**HAF**	أساسيات الصحة و اللياقة The basics of Health and Fitness	٢
101	**LHR**	الأنظمة وحقوق الإنسان Laws and Human Rights	٢
101	**VOW**	العمل التطوعي Voluntary Work	٢
101	**ENG**	اللغة الإنجليزية	٢
101	**SALM**	المدخل إلى الثقافة الإسلامية Introduction to Islamic Culture	٢
102	**SALM**	الإسلام وبناء المجتمع Islam and Society	٢
103	**ARAB**	التحرير العربي Arabic editing	٢
103	**SALM**	النظام الاقتصادي في الإسلام	٢

	Economic System in Islam		
٢	أسس النظام السياسي في الإسلام The Basics of the Political System in Islam	**SALM**	**104**
٤- متطلبات الكلية الإجبارية : **college compulsory requirements**			
عدد الساعات المعتمدة **Number of credit hours**	اسم المقرر **Course name**	رمز المقرر **Course code**	رقم المقرر **Course number**
٢	تقنيات التعليم ومهارات الاتصال Teaching techniques and Communication skills	**EDU**	**116**
٢	أصول التربية الإسلامية Fundamentals of Islamic Education	**EDU**	**117**
٢	نظام وسياسة التعليم في المملكة العربية السعودية The System and Policy of Education in KSA	**EDU**	**118**
٢	علم نفس النمو Developmental Psychology	**EDU**	**126**
٢	صحة نفسية Psychological Health	**EDU**	**216**
٢	مبادئ البحث التربوي Principles of Educational Research	**EDU**	**217**
٢	علم النفس التربوي Educational Psychology	**EDU**	**226**
٢	إدارة وتخطيط تربوي Administration and Educational Planning	**EDU**	**316**
٢	إنتاج مصادر التعلم الإلكترونية Production of E-learning resources	**EDU**	**317**
٢	Teaching Strategies	**EDU**	**326**
٢	المناهج التعليمية	**EDU**	**327**

	Curricula		
416	EDU	اتجاهات حديثة في استراتيجيات التدريس Modern Trends in Teaching Strategies	٢
417	EDU	التقويم التربوي Educational Evaluation	٢
٤٢٦	EDU	التربية الميدانية Practicum	٦

٥- متطلبات الكلية الاختيارية : **The college electives**

رقم المقرر **Course number**	رمز المقرر **Course code**	اسم المقرر **Course name**	عدد الساعات المعتمدة **Number of credit hours**
		لا يوجد**none**	

٦- متطلبات القسم الإجبارية **The department electives**

رقم المقرر **Course number**	رمز المقرر **Course number**	اسم المقرر **Course name**	عدد الساعات المعتمدة **f credit hours**
111	CHEM	كيمياء عامة (١) **general chemistry (1)**	
111	MATH	حساب التفاضل والتكامل (١) Calculus(1)	
111	PHYS	فيزياء عامة (١) **General physics (1)**	
121	CHEM	كيمياء عضوية (١) **Organic chemistry (1)**	
122	CHEM	كيمياء غير عضوية (عناصر رئيسية) **Inorganic chemistry (main group elements)**	
125	COMP	مقدمة في الحاسب الآلي **Introduction to computer**	

	مقدمة في المعادلات التفاضلية **Introduction to differential equations**	**MATH**	**123**
	الإحصاء الحيوي **Biostatistics**	**STAT**	**101**
	كيمياء عضوية (٢) **Organic chemistry 2**	**CHEM**	**211**
	كيمياء فيزيائية قاعدة صنف **Physical chemistry- Phase Rule**	**CHEM**	**212**
	كيمياء عامة ٢ **General chemistry 2**	**CHEM**	**213**
	فيزياء عامة ٢ **General physics 2**	**PHYS**	**123**
	كيمياء حلقية غير متجانسة **Heterocyclic Compounds chemistry**	**CHEM**	**221**
	كيمياء الكم (١) **Quantum Chemistry (1)**	**CHEM**	**222**
	كيمياء عضوية فيزيائية **Physical organic chemistry**	**CHEM**	**223**
	كيمياء تحليلية وصفية **Descriptive Analytical Chemistry**	**CHEM**	**224**
	كيمياء فيزيائية (كهربية عكسية (١) **Electro-Reversible Chemistry 1**	**CHEM**	**225**
	كيمياء الكم (٢) **Quantum Chemistry (2)**	**CHEM**	**311**
	كيمياء الديناميكا الحرارية **Thermodynamic chemistry**	**CHEM**	**312**

314	CHEM	كيمياء عضوية (بوليمرات ونفط) **organic chemistry (polymers and patrol)**	
315	CHEM	كيمياء تحليلية كمية **Quantitative Analytical Chemistry**	
316	CHEM	كيمياء فيزيائية (سطوح وغرويات وحفز) **Physical Chemistry (Surfaces, Colloid s & Catalysis)**	
321	CHEM	كيمياء حيوية (١) **Biochemistry 1**	
322	CHEM	كيمياء غير عضوية (عناصر انتقالية) **inorganic chemistry(transition elements)**	
323	CHEM	كيمياء فيزيائية (كهربية عكسية ٢) **Electro-Reversible Chemistry 2**	
324	CHEM	كيمياء تناسقية **Coordination chemistry**	٣
411	CHEM	كيمياء التحليل الآلي **Instrumental Analysis Chemistry**	٤
412	CHEM	كيمياء فيزيائية حركية **Kinetic Chemistry**	٣
413	CHEM	كيمياء الأصباغ **Dyes chemistry**	٤
414	CHEM	كيمياء حيوية ٢ **Biochemistry 2**	٣
421	CHEM	كيمياء عضوية منتجات طبيعية **Natural Products Chemistry**	٣
422	CHEM	كيمياء ميكانيكا التفاعلات العضوية **Chemistry of organic reactions mechanisms**	٢
423	CHEM	كيمياء عضوية (أطياف المركبات العضوية) **organic chemistry (Organic Compounds Spectra)**	٤
424	CHEM	كيمياء نووية وإشعاعية **Nuclear and Radiation Chemistry**	٣
٧- متطلبات القسم الاختيارية: **department electives**			

رقم المقرر **Course number**	رمز المقرر **Course code**	اسم المقرر **Course name**	عدد الساعات المعتمدة **f credit hours**
		لا يوجد **none**	

٨- المقررات الحرة:

رقم المقرر **Course number**	رمز المقرر **Course code**	اسم المقرر **Course name**	عدد الساعات المعتمدة **f credit hours**
		لا يوجد	

٩- متطلبات التدريب:**training requirements**

رقم المقرر **Course number**	رمز المقرر **Course code**	اسم المقرر **Course name**	عدد الساعات المعتمدة **f credit hours**
٤٢٦	**EDU**	التربية الميدانية **Field education**	٦

١٠- توزيع المقررات على المستويات**the distribution of courses on the levels**

المستوى الأول**level one**

رقم المقرر **Course number**	رمز المقرر **Course code**	اسم المقرر **Course name**	توزيع الوحدات الدراسية **The distribution of the study units**				رقم و رمز المتطلب السابق (المرافق) **Number and cod of the prerequisite**
			نظري	عملي	تدريب (تمارين)	معتمد	
111	**CHEM**	كيمياء عامة (١) **general chemistry (1)**	**1**	**2**	**0**	**2**	
116	**EDU**	تقنيات التعليم ومهارات الاتصال	**2**	**0**	**0**	**2**	

		Teaching techniques and Communication skills					
117	EDU	أصول التربية الإسلامية Fundamentals of Islamic Education	2	0	0	2	
118	EDU	نظام وسياسة التعليم في المملكة العربية السعودية The System and Policy of Education in KSA	2	0	0	2	
111	MATH	حساب التفاضل والتكامل (١) Calculus 1	1	0	2	2	
111	PHYS	فيزياء عامة (١) General physics1	1	0	2	2	
		متطلب جامعي University requirement	2	0	0	2	
		متطلب جامعي university requirement	2	0	0	2	
		متطلب جامعي University requirement	2	0	0	2	
المجموع total		١٨ ساعة					
المستوى الثاني level two							

رقم المقرر Course number	رمز المقرر Course code	اسم المقرر Course name	توزيع الوحدات الدراسية The distribution of study units				رقم و رمز المتطلب السابق (المرافق) Number a
			نظري	عملي	تدريب (تمارين)	معتمد	
121	CHEM	كيمياء عضوية (١) Organic chemistry 1	3	2	0	4	
122	CHEM	كيمياء غير عضوية (عناصر رئيسية) Inorganic chemistry Main elements	2	0	0	2	
125	COMP	مقدمة في الحاسب الآلي Introduction to computer	2	0	2	3	
126	EDU	علم نفس النمو Developmental psychology	2	0	0	2	
123	MATH	مقدمة في المعادلات التفاضلية Introduction to differential equations	2	0	0	3	MATH 111
101	STAT	الإحصاء الحيوي biostatistics	1	0	0	2	
		متطلب جامعي University number	2	0	0	2	
المجموع total		١٨ ساعة					

المستوى الثالث **level three**							
رقم المقرر **Course number**	رمز المقرر **Course code**	اسم المقرر **Course name**	توزيع الوحدات الدراسية **The distribution of study units**				رقم و رمز المتطلب السابق (المرافق) **The number and code of prerequisite**
			نظري	عملي	تدريب (تمارين)	معتمد	
211	**CHEM**	كيمياء عضوية ٢ **Organic chemistry 2**	**3**	**2**	**0**	**4**	**121 CHEM**
212	**CHEM**	كيمياء قاعدة صنف **Physical chemistry- Phase Rule**	**2**	**2**	**0**	**4**	
213	**CHEM**	كيمياء عامة ٢ **General chemistry 2**	**2**	**2**	**0**	**3**	**111 CHEM**
216	**EDU**	صحة نفسي Psychological Health	**2**	**0**	**0**	**2**	**EDU 126**
217	**EDU**	مبادئ البحث التربوي Principles of Educational Research	**2**	**0**	**0**	**2**	
123	**PHYS**	فيزياء عامة (٢) **Physics 2**	**2**	**2**	**0**	**3**	**PHYS 111**
		متطلب جامعي	**2**	**0**	**0**	**2**	

					University requirement		
المجموع **total**					١٨ ساعة		
المستوى الرابع **level four**							
رقم المقرر **Course number**	رمز المقرر **Course code**	اسم المقرر **Course name**	توزيع الوحدات الدراسية **The distribution of study units**				رقم و رمز المتطلب السابق (المرافق) **The number and code of prerequisite**
			نظري **Theo**	عملي	تدريب (تمارين)	معتمد	
221	**CHEM**	كيمياء حلقية غير متجانسة **Heterocyclic Compounds chemistry**	**2**	**4**	**0**	**4**	**CHEM 211،121**
222	**CHEM**	كيمياء الكم (١) **Quantum chemistry 1**	**2**	**0**	**0**	**2**	**MATH 123**
223	**CHEM**	كيمياء عضوية فيزيائية **Physical organic chemistry**	**2**	**0**	**0**	**2**	**CHEM 211،121**
224	**CHEM**	كيمياء تحليلية وصفية **Descriptive**	**2**	**2**	**0**	**3**	

		Analytical Chemistry					
225	CHEM	كيمياء فيزيائية (كهربية عكسية ١) Electro-Reversible Chemistry 1	2	2	0	3	
226	EDU	علم النفس التربوي Educational Psychology	2	0	0	2	EDU 126
		متطلب جامعي University requirment	2	0	0	2	
المجموع total		١٨ ساعة 18 credit hours					

المستوى الخامس **level five**

رقم المقرر Course number	رمز المقرر Course code	اسم المقرر Course name	توزيع الوحدات الدراسية The distribution of study units				رقم و رمز المتطلب السابق (المرافق) The number and code of prerequisite
			نظري thoe	عملي	تدريب (تمارين)	معتمد	
311	CHEM	كيمياء الكم (٢) Quantum Chemistry (2)	2	0	0	2	CHEM 222
312	CHEM	كيمياء الديناميكا الحرارية Thermodynamic chemistry	2	2	0	3	
314	CHEM	كيمياء عضوية (بوليمرات ونفط)	2	2	0	3	CHEM 211،121

		organic chemistry (polymers and patrol)					
315	**CHEM**	كيمياء تحليلية كمية **Quantitative Analytical Chemistry**	**2**	**2**	**0**	**3**	**CHEM 224**
316	**CHEM**	كيمياء فيزيائية (سطوح وغرويات وحفز) **Physical Chemistry (Surfaces, Colloids & Catalysis)**	**2**	**2**	**0**	**3**	
316	**EDU**	إدارة وتخطيط تربوي Administration and Educational Planning	**2**	**0**	**0**	**2**	
317	**EDU**	إنتاج ومصادر التعلم الإلكترونية Production of E-learning resources	**2**	**0**	**0**	**2**	
المجموع		١٨ ساعة					

المستوى السادس **level six**

رقم المقرر **Course number**	رمز المقرر **Course code**	اسم المقرر **Course name**	توزيع الوحدات الدراسية **Distribution of study units**				رقم و رمز المتطلب السابق (المرافق)
			نظري	عملي	تدريب (تمارين)	معتمد	

321	CHEM	كيمياء حيوية (١) **Biochemistry 1**	2	2	0	3	
322	CHEM	كيمياء غير عضوية (عناصر انتقالية) **inorganic chemistry(transition elements)**	4	0	0	4	CHEM 122
323	CHEM	كيمياء فيزيائية (كهربية عكسية ٢) **Electro– Reversible Chemistry 2**	3	2	0	4	CHEM 225
324	CHEM	كيمياء تناسقية **Coordination chemistry**	2	2	0	3	CHEM 122
326	EDU	استراتيجيات التدريس Teaching Strategies	2	0	2	2	
327	EDU	المناهج التعليمية Curricula	2	0	2	2	
المجموع		١٨ ساعة					

level seven المستوى السابع

رقم المقرر **Course number**	رمز المقرر **Course code**	اسم المقرر **Course name**	توزيع الوحدات الدراسية **The distribution of study units**				رقم و رمز المتطلب السابق (المرافق) **The Name and code of prerequisite**
			نظري	عملي	تدريب (تمارين)	معتمد	

416	**EDU**	اتجاهات حديثة في استراتيجيات التدريس Modern Trends in Teaching Strategies	**2**	**0**	**0**	**2**	**EDU 326**
417	**EDU**	التقويم التربوي Educational Evaluation	**2**	**0**	**0**	**2**	
411	**CHEM**	كيمياء التحليل الآلي **Instrumental Analysis Chemistry**	**3**	**2**	**0**	**4**	
412	**CHEM**	كيمياء فيزيائية حركية **Kinetic Chemistry**	**2**	**2**	**0**	**3**	**CHEM 312**
413	**CHEM**	كيمياء الأصباغ **Dyes chemistry**	**3**	**2**	**0**	**4**	**CHEM 221**
414	**CHEM**	كيمياء حيوية ٢ **Biochemistry 2**	**2**	**2**	**0**	**3**	**CHEM 321**
totalالمجموع		١٨ ساعة					

level eight المستوى الثامن

رقم المقرر **Course number**	رمز المقرر **Course code**	اسم المقرر **Course name**	توزيع الوحدات الدراسية **The distribution of study units**				رقم و رمز المتطلب السابق (المرافق) The prerequisite Number & Code
			نظري	عملي	تدريب	معتم	

426	EDU	التربية الميدانية **Field education**	0	0	12	6	**EDU 416،326**	
421	CHEM	كيمياء عضوية منتجات طبيعية **Natural Products Chemistry**	2	2	0	3	**CHEM 221**	
422	CHEM	كيمياء ميكانيكا التفاعلات العضوية **Chemistry of organic reactions mechanisms**	2	0	0	2	**CHEM 211،121**	
423	CHEM	كيمياء عضوية (أطياف المركبات العضوية) **organic chemistry (Organic Compounds Spectra)**	3	2	0	4	**CHEM 411**	
424	CHEM	كيمياء نووية وإشعاعية **Nuclear and Radiation Chemistry**	3	0	0	3		
المجموع	**total**	١٨ ساعة						

5. Program & Course Description
1. Program Description: Attached
2. Module Description: Attached
Brief ModuleDescription: Attached

Form (5)
Brief Module Description

General Chemistry (1) Physical	Course Name
CHEM111	Course Number
NA	Pre-requisite Name & Number
First Level	Course Level
2 theoretical hrs. & 2 practical hrs. per week	Credit Hours

Module Title:	General Chemistry (1)
Module ID:	Chem. 111
Prerequisite:	___
Level:	First level
Credit Hours:	2 (one theoretical hour and two practical hours) a week

Module Description

Giving students the basics of physical chemistry for the matter states and the chemical equilibrium- Le Chatelie's Principle	

Module Aims

1	Knowledge of the basics of physical Chemistry
2	Knowledge of states and laws of the material
3	Definition of solutions and chemical equilibrium – Le Chatelie's Principle
4	Knowledge of topics which are a starting point and basis for the study of chemistry in higher levels

Learning Outcomes

1	**Fundamentals of physical chemistry**
2	**Matter states laws and matching the laws verbal text with the accompanying graphs**
3	**All kinds of solutions - the application of laws to solve problems**
4	**Chemical equilibrium and Le Chatelie's Principle - the application of the law of mass action on compounds**
5	**The students' ability to connect both the theoretical and practical aspects of the course**
6	**Knowledge of how to prepare different solutions from solid and aqueous substance and using titration methods to determine the concentration and normality for different solutions.** معرفة كيفية تحضير محاليل من مواد صلبة وسائلة واستخدام أنظمة المعايرات في تحديد التركيز والعيارية لمختف المحاليل.

Module Content

(Hours)	(Weeks)	List of topics
1	1	**An introduction to the basics of General Chemistry (1) Physical-main & sub units-mole.**
2	2	**Gaseous state:** • Boyle's law • Charles's law and Kelvin scale of temperature • Application of Charles's law and Boyle's law • Combined gas law, ideal gas equation and universal gas constant • Dalton's law of partial pressure • Mathematical derivation of Dalton's law and their applications • Graham's law of diffusion and its applications • Kinetic model of gas and its postulates

3	**3**	**Pressure Law & Public Law of gases and its applications- Movement Theory of gases- Basic hypotheses- Basic equation- The Maxwell-Boltzmann of molecular speeds- derivation of ideal gas laws**
4	**4**	**Liquid state:** - Physical properties of liquid - Evaporation and condensation -Vapor pressure of liquid and boiling - Surface tension - Viscosity - Maxwell-Boltzmann distribution - Boiling point -Latent heat of vaporization - Freezing point
2	**2**	**Solutions- their types- solubility-ways of expressing concentration- factors affecting solubility- solutions of complete mix**
2	**2**	**:Chemical equilibrium** Reversible and irreversible reactions Law of mass action Equilibrium constant (Kc) and its characteristics Homogenous and heterogeneous equilibrium Le-Chatelier's Principle and its application
		Practical:
2	**2**	Identifying the laboratory tools and methods.
2	**2**	**Preparation of solutions (solids)** **A standard solution of sodium carbonates- a standard solution of sodium hydroxide.**
2	**1**	**Liquid material (preparation of hydrochloric acid solution)**

2	2	Determining the concentration of hydrochloric acid solution using sodium carbonates solution
2	1	Determining sodium hydroxide solution concentration (NAOH) using the standard hydrochloric acid solution.
2	1	Determining the standard hydrochloric acid solution concentration using the sodium hydroxide solution.
2	1	Estimating the strength and titer of sodium carbonates, sodium hydroxide by mixing them using the standard hydrochloric acid.
2	1	Estimating ammonia in ammonium salt.

Textbook and Supporting References

General Chemistry	Textbook title
Adel Ahmad Garar	Author's Name (main)
Al-Falah Library- Jordanian University	Publisher
1992	Publishing Year
General Chemistry	Reference (1)
Al-Ewais	Author's Name
Dar-Khuraiji Library	Publisher
1993	Publishing Year

Form (5)
Brief Module Description

Inorganic chemistry (main group elements)	Course Name
CHEM122	Course Number
CHEM 213General Chemistry (2)	Pre-requisite Name & Number
Level Two	Course Level
2 Theoretical hrs.	Credit Hours
Module Title:	Inorganic Chemistry (main group elements)
Module ID:	CHEM 122
Prerequisite:	CHEM 213
Level:	Second Level
Credit Hours:	2 Theoretical

Module Description

Identifying the main groups and their arrangement in the periodic table of the elements and their different characteristics.	

Module Aims

Study of the bonding among the elements of the main groups and their periodic properties.	١
Identifying the characteristics of the elements through the groups they belong to.	٢

Learning Outcomes

Identifying elements in the various groups.	١
Knowledge of the properties of the elements in each group.	٢
Identifying the theories of bonding for various elements.	٣

Module Content

(Hours)	(Weeks)	List of topics
2	**2**	An introduction that includeselectronic structure and periodic classification of elements, periodic properties of the elements, sizes of atoms and ions, ionization potential, *electro negativity, electron affinity,*metallic properties.
2	**7**	- Ionicandcovalent bonding, the nature of solids,some of ionic compounds. - Energy,calculation of lattice energy, some applications of lattice energies, Born-Haber cycle**.** - An introduction to covalent compounds, Valence bond theory,

		Valence bond theory of hydrogen molecule H_2, Hybridization of hydrogen molecule H_2Molecular orbital (MO) theory, Molecular Orbital (MO) theory of the H_2 molecule. - Building Molecular Orbital Diagrams for Homonuclear and Heteronuclear diatomic molecules
2	**6**	Types of Solids, Band Theory, State that silicon and germanium are semiconductor materials. Hydrogen and its compounds, Physical and chemical properties of hydrogen. Chemical properties of s and p block elements. Diagonal relationship Li and Mg. Chemical properties of Beryllium. The difference between Beryllium and Aluminum. Introduction to Electron-deficient compound. Chemistry of boron.

Textbook and Supporting References

MainGroup Chemistry	**Textbook title**
Muhammad Ali Khalifa As-Saleh	**Author's Name (main)**
Al-Obiakan Library	**Publisher**
2008	**Publishing Year**
Inorganic chemistry	**Reference (1)**
James E. Huhey	**Author's Name**
Arabic Language Complex Publications, Jordan	**Publisher**
1983	**Publishing Year**

Form (5)

Brief Module Description

Quantitative Analytical Chemistry	**Module Title**
CHEM315	**Module ID**
Descriptive Analytical Chemistry **CHEM 224**	**Prerequisite**
Level 5	**Level**
3 (2 theoretical + 2 practical)	**Credit Hours**

Module Title:	**Quantitative analysis**
Module ID:	**Chem 315**
Prerequisite:	**Descriptive analysis, Chem 224**
Level:	**Five**
Credit Hours:	**3 (2+2)**

Module Description

Identifying the concept of the quantitative analysis which includes the study of the various titration system. Study of the main concepts in gravimetric analysis which includesthe theoretical bases of precipitation.	

Module Aims

Identifying the importance of quantitative analysis and volumetric titration and its concept.	١
Focus on the concept of volumetric for different calibrations.	٢
Studying various images of sediment.	٣

Learning outcomes

To learn the concept of quantitative analytical chemistry and its importance.	١
أن يميز الطلبة بين مفهوم التحليلية الحجمية والتحليلية الوزنية.	٢
To be skilled atsolving the various calibrations volumetric calculations of all kinds. **The ability to deal with different systems laboratory calibrations and**	٣

the use of volumetric tools.	
The ability to deal with the different systems of laboratory calibrations and the use of volumetric tools.	٤

Course Content

(Hours)	(Weeks)	List of Topics
2	1	A general introduction into analytical quantitative chemistry and its types of volumetric gravimetric.
8	4	Calibrations tie and calculations for the pH, the evidence and reagents. دقة معايرات التعادل وتطبيقاتها.
2	1	Deposition calibrations (Mohr- way Foherd- Fagan)
2	1	Oxidization and redox titrations and its applications.
2	1	Calibrations formation of complexes and complexes and their applications.
8	4	Introduction to gravimetric analysis and gravimetric analysis steps. Photos deposited with an explanation of the theoretical foundations of the deposition.
4	2	Completion of the deposition and the factors effecting it with an explanation of organic and inorganic precipitates.

Textbooks and Supporting References

Analytical Chemistry: Volumetric and Weighted Analysis	**Textbook title**
Ibrahim Zamel Al-Zamel	**Author's Name (Main)**
Dar Al-Kheregein for Publication and Distribution	**Publisher**
1993	**Publishing Year**

Quantitative Analytical Chemistry for University Students	**Reference (1)**
Muhammad Ahmed Ashy	**Author's Name**
Dar Al-Elm Printing House	**Publisher**
1990	**Publishing Year**

Form Five

Brief ModuleDescription

Descriptive Analytical Chemistry	**Course name**
Chem 224	**Course code & number**
General Chemistry (1) CHEM. 111	**Pre-requisite code & number**
Level Four	**Course level**
3(2 theoretical +2 practical)	**Credit hours**

Module Title:	**Descriptive analysis**
Module ID:	**Chem 224**
Prerequisite:	**General chemistry (1), CHEM 111**
Level:	**Four**
Credit Hours:	**3 (2+2)**

Module Description

Identifying the descriptive analysis and studying the inorganic chemical reactions –focusing on the values of equilibrium constants.	

Module Aims

1	**Identifying the importance of descriptive analysis and its basis.**
2	**Identifying the types of inorganic reactions.**
3	**Focusing on the values of equilibrium constants.**

Learning Outcomes

1	**To know the concept of descriptive analytical chemistry and its importance.**
2	**To distinguish between the basics of both quantitative and qualitative analysis and the differences between them.**
3	أن يمتلك الطلبة مهارة كتابة ثابت سرعة الاتزان لمختلف التفاعلات غير العضوية. **To be skilled at writing for different inorganic reactions.**
4	التعرف على مختلف تعابير التراكيز وكيفية حسابها. **To identify different expressions of concentrations and methods of calculation.**

Course Content

(Hours)	(Weeks)	List of topics
4	**2**	- A general introduction to descriptive analytical chemistry with its all types which includes: - The importance of the study of analytical chemistry in the areas of pharmacy, the environment and nature. - The importance of the study of descriptive analysis.
6	**3**	- The basics of descriptive analysis. - Some of the devices which are used for descriptive analysis.

8	**4**	- The theoretical bases for the separation and analysis of mixtures and analysis of various samples.
2	**1**	- Descriptive analysis and methods used in the expression of different concentrations.
6	**3**	- Equilibrium and the formation of complexes. -ثابت الاتزان في تفاعلات التعادل
2	**1**	-الترسيب والاتزانPrecipitation equilibrium

Textbook & Supporting References

Analytical Chemistry	**Textbook title**
Donald دونالدجبيترزيك	**Author's Name (main)**
Translated by Abdul-MottlebJaber	**Publisher**
1984	**Publishing Year**
Analytical Chemistry	**Reference (1)**
Muhammad Ali KHalifa As-Saleh	**Author's Name**
King Saud University	**Publisher**
1987	**Publishing Year**

Form (5)
Brief Module Description

Chemistry of Heterocyclic Compounds	**Course name**
CHEM 221	**Course code & number**
CHEM 211 (Organic 2)	**Pre-requisite code & number**
Level Four	**Course level**
4	**Credit hours**
Module Title:	**Chemistry of Heterocyclic Compounds**

Module ID:	**CHEM 221**
Prerequisite:	**CHEM. 211**
Level:	**4th**
Credit Hours:	**4**

Module Description

Five member ring compounds having one heterocyclic atom, methods of preparation, reactions and its importance.
Indole and its analogous, methods of preparation and physical properties.
Six-member ring compounds having one heterocyclic atom, methods of preparation and reactions.
Study of the methods of preparation and reactions of quinolineand iso quinolone.
Study of five member ring compounds having two heterocyclic atoms.
Six-member ring compounds having two heterocyclic atoms.
b. Practical: **1.Preparation of some heterocyclic compounds like:** 1.3,4-dicrbothioxypyrrolate 2-3,5-dimethylpyrazolate 3.nicotonic 4-3-phenylindol **2.Study of organic mixtures** 1.acid +acid 2.acid +base 3.acid+phenol 4.base+phenol 5.acid + Neutral 6.base+Neutral 7. Neutral + Neutral

Module Aims

1	**Students identify the heterocyclic compounds.**
2	**Students identify the importance of these compounds.**
3	**Students identify how heterocyclic compounds may be named**

Learning Outcomes

1	**- Recognize some five-member ring compounds having one heterocyclic atom, methods of preparation, reactions and its properties.** **- Recognize some six member ring compounds having one heterocyclic atom, methods of preparation, reactions and its properties.** **-Recognize some five/six-member ring compounds having two heterocyclic atoms methods of preparation, reactions and its properties.** **-Recognize the importance of heterocyclic compounds and some of its applications.**
2	**1. Apply the Nomenclature of heterocyclic compounds.** **2. Apply some of the mechanisms of heterocyclic reactions.**
3	**-Solve some exercises in groups.** **-Conduct a groupresearch.**
	- Calculating the product percentage. **- Using chemical Internet sites.**

Course Content

(Hours)	(Weeks)	List of topics
6	**3**	**A. Theoretical:** - Introduction of nonaromatic and aromatic heterocyclic compounds and nomenclature.
8	**4**	- Chemistry of five-membered aromatic heterocyclic compounds containing one heterocyclic, methods of preparation, reactions and importance.
2	**1**	- Chemistry of Indoles and related compounds, reactions, methods of preparation and physical properties.
4	**2**	- Chemistry of six-membered aromatic heterocyclic

		compounds containing one heterocyclic atom, methods of preparation and chemical reactions.
2	**1**	- Chemistry of quinoline, isoquinolin, synthesis and reactions.
6	**3**	- Chemistry of five-membered ring heterocycles with two or more than one heteroatom.
2	**1**	- Chemistry of six membered ring heterocycles with two or more than one heteroatom.
42	**13**	**Total**
		1. Synthesis and reactions of selected heterocyclic compounds.
2	**1**	١-مركب ٣،٤-ثنائي كربواثيوكسيبيرولات
2	**1**	٢- ٣،٥-ثنائي ميثيل بيرازولات
4	**2**	٣-حمض النيكوتيك
2	**1**	٤--٣-فينيل اندول
		2. Chemistry of mixtures compounds
2	**1**	١-مخلوط حمض+حمض
2	**1**	٢-مخلوط حمض+قاعدة
2	**1**	٣- مخلوطحمض+فينول مخلوط
2	**1**	٤-مخلوط قاعدة +فينول
2	**1**	٥-مخلط حمض+متعادل
2	**1**	٦-مخلوط قاعدة+ متعادل
2	**1**	٧-مخلوط متعادل + متعادل
24	**12**	

Textbook and Supporting References

المركبات الحلقية غير المتجانسة والحيوية Organic and Hetrocyclic Chemistry	**Textbook title**
Hamad Bin Abdullallh Al-Hedan, Muhammad Ibrahim Hassan, Salim Bin SelimAz-Zeib	**Author's Name (main)**
King Saud University	**Publisher**
1423	**Publishing Year**
المركبات الحلقية غير المتجانسة Hetrocyclic Chemistry	**Reference (1)**
Hassan Muhammad Al-hazmy, Nasser Muhammad Al-MohendesSeham Abdul-Rahman Essa	**Author's Name**
King Saud University	**Publisher**
1422	**Publishing Year**

Form Five
Brief Module Description

General Chemistry (2) In Organic	**Course name**
CHEM 213	**Course code & number**
CHEM 111(1)	**Pre-requisite code & number**
Level 1	**Course level**
2 theoretical+ 2 practical	**Credit hours**

Module Title:	**General Chemistry (2) Inorganic**
Module ID:	**CHEM 213**
Prerequisite:	**General Chemistry (1) CHEM 111**
Level:	**Level III**
Credit Hours:	**2 practical+2 theoretical.**

Module Description

- Definition of requesting quantum numbers - new Periodic Table – magnetic, properties (Paramagnatic - Diamagnetic). - Methods of preparation of some compounds(sodium hydroxide – sulfuric). - Definition of equivalence theory - molecular weight and equivalence weight and illustrating their importance in different preparations.	

Module Aims

1	Students recognize the fundamentals of atom structure.
2	Periodic Table of the elements
3	Bonds
4	The molecular structure

Learning Outcomes

Description of the knowledge to be acquired through the course: - This course is an entrance to the study of the courses of chemistry demands for students and represents the basic requirement for each of these courses. It consists of two parts: theoretical and practical. The course aims to strengthen the chemistry concepts students had in the pre university stage with the addition of more of these concepts as well as providing them with additional concepts necessary to study the subsequent courses in the different branches of the science of chemistry. The practical side aims at teaching the psychomotor skills and promoting the sense of security and safety in the chemical laboratory. Further, it aims at developing students' positive attitudes towards chemistry.

Course Content

1. Topics to be covered:		
Hours	**Weeks**	**Topics**
2	**6**	**1-The atomic structure:** Electromagnetic radiation and electromagnetic wavelengths for each area. - Atomic spectra- continuous spectrum- linearspectrum(atomic emissionspectrum)- - Raadbergequation - ChainsSpectrum(Palmer LehmanPassion) Atomic numbersdiscovery ofX-rays andX-rayslinked toeach elementof atomicnumbers,atomic numbersrelated tothe number ofprotons in the nucleus(Rutherford experimentsandMosls). - Bohr theory of the hydrogen atom - Quantum theory for Planck Uncertainty rule for Heyznberg: - Schrodinger equationof quantumnumbersandatomicforms - Orbitals Arrangementsfor theelectronicelements ofmanyelectrons(the principle ofUV) - Pauliexclusionprinciple - Hundbaseandspinof electrons
		2. Periodicelements:

2	**3**	Modern periodic tableandelectronic structureof the elements Periodicinthe electronic structureof the elements ofthe periodictrendsin thevalenceofelements, metals andnon-metals, the change in theclimatecharacteristics: Sizeandatomicionwith an explanation ofthe effectivenuclear charge, andionization energy, electron affinity, electronegativity.
2	**3**	**3-Chemical bonds:** StructuresLewislinksionicfactors affectingtheionic bondingof covalent bonding, the rank ofthe associationof harmonizingresonancecovalent bondspolar molecules
2	**3**	**4-Covalent bondsandpartialstructure** Molecular shapesanddissonancetheorypairsvalenceVSEPR. Theory ofcovalent bonds 1.Valence bondtheoryVB 2.Hybridization 3. Molecular Orbitals theoryMO
Practical		
2 **2** **2**	**2** **2** **1**	- Identifying tools and laboratory methods - Preparation of solutions - A standard solution of sodium carbonate – a standard solution of sodium hydroxide - Liquids (hydrochloric acid solution)
2	**2**	Determining the concentration of hydrochloric acid solution using sodium carbonates solution.
2	**1**	Determining sodium hydroxide solution concentration (NAOH) using the standard hydrochloric acid solution.
2	**1**	**Mid-term exam**
2	**1**	Determining the standard hydrochloric acid solution concentration using the sodium hydroxide solution.
2	**1**	Determining the strength and titeof sodium carbonate and sodium hydroxide in a mixture of both using the standard hydrochloric acid.
2	**1**	Estimating ammonia in ammonium salt.
2	**2**	**General revision**

Textbook and Supporting References

General Chemistry	Textbook title
Salah Mustafa Sultan	Author's Name (main)
Al-Obiakan Library	Publisher
1424 H	Publishing Year
General Chemistry	Reference
Ahmed Abdul-Aziz Al-Eweis	Author's Name
Dar Al-Khergeen for Publications and distribution	Publisher
١٤٣٧هـ	Publishing Year

Form (5)
Brief Module Description

Organic Chemistry (2)	Course name
CHEM 211	Course code & number
CHEM 121 (Organic 1)	Pre-requisite code & number
Level Three	Course level
4	Credit hours

Module Title:	Organic Chemistry (2)
Module ID:	Chem 211
Prerequisite:	Chem. 121
Level:	3rd
Credit Hours:	4

Module Description

Organic halides, nomenclature, methods of preparation, physical properties, reactions
Alcohols, their classifications, terminology, methods of preparation, physical properties, reactions, acidity, esters formation, oxidation
Ether, epoxides, nomenclature, structural characteristics classification, physical properties; synthesis and reactions

Phenols ,methods of preparation, physical properties, reactions (acidity, esters formation, electrophilic substitution, oxidation)
Amines, nomenclature, methods of preparation, physical properties, reactions, use of diazonium salts in preparations.
Aldehydes and ketones, nomenclature, methods of preparation, physical properties, reactions (electrophilic addition like cyanohydrin formation ,hydrates, with alkali nitrogen compounds, condensation reactions, oxidation and reduction)
Carboxylic acids and their derivatives (esters, acids halides, anhydrides, amides, nitriles), nomenclature, methods of preparation, physical properties, reactions of acids (acidity, salt formation, nucleophilic substitution reactions, halogenation of alpha carbon atom, decarboxylation, electrophilic substitution). Carboxylic acid derivatives method of preparation (hydration), reduction of acids and their derivatives
Practical: **Study of reactions for functional groups of different organic compounds-studying their reactions.**
Detection of unknown organic compounds, preparation of their derivatives and writing a report on how to identify this unknown.

Module Aims

1	**Students identify the properties of acid halides, alcohols, phenols, ethers, epoxides, aldehydes, ketones, carboxylic acids and their derivatives and amines.**
2	**Nomenclature bases**
3	**Their reactions and methods of preparations**
4	**Study of some specific models and their applied benefits**

Learning Outcomes

1	- المقدرة على تسمية هذه المركبات بالطرق الشائعة و النظامية - التعرف على على بعض طرق التحضير لهذه الطوائف - التعرف على بعض تفاعلاتها - التعرف إلى بعض خواصها و بعض فوائدها التطبيقية **Knowledge:**

	- Identifying the general formulas of (acid halides, alcohols, phenols, ethers, epoxides, aldehydes and ketones, carboxylic acids and their derivatives and amines) nomenclature of organic compounds by IUPAC and common methods of reactions preparation of these compounds and some of their properties and applied benefits.
2	**Cognitive skills:** **- Be able to name compounds under study.** **- Be able to write reaction equations under study**
3	**Interpersonal Skills & Responsibility:** **- Solving some exercises working in groups** **-Doing aresearch as a group**
4	**Communication, Information Technology, Numerical** **- Calculating the product percentage for materials under study and identifying organic compound.** **- Using chemical Internet sites.**

Course Content

(Hours)	(Weeks)	List of topics
3	**1**	Organic halidesnomenclature, structural characteristics classification , physical properties, synthesis and reactions
6	**2**	Alcohols, nomenclature, structural characteristics classification, physical properties; synthesis and reactions**.**
6	**2**	Ether, epoxides, nomenclature, structural characteristics classification, physical properties; synthesis and reactions.
6	2	Phenols, nomenclature, structural characteristics classification, physical properties; synthesis and reactions (acids-esters formation, electrophilic exchange and oxidation)
3	**1**	Amiens, nomenclature structural characteristics classification, physical properties, synthesis and reactions, using diazinium salts in laboratory preparations.
9	**3**	Aldehydes and ketones, nomenclature, structural characteristics, physical properties; synthesis and reactions الاضافة الالكتروفيلية(….,condensation, oxidation and reduction). مثل تكوين السيانوهيدرين ،و الهيدرات ومع مركبات النتروجين القاعدية
9	**3**	Carboxylic acids, their derivatives (….), nomenclature, structural characteristics, physical properties; synthesis,

		reactions (…) acids reduction and their derivatives. (استرات ،هاليدات حموض، بلاماءات ،أميدات ، نتريلات) و تفاعلاتها (الحمضية ، تكوين الاملاح ، تفاعلات الاستبدال النيكليوفيلية ، هلجنة ذرة كربون ألفا ، نزع ثاني أكسيد الكربون ، تفاعلات الاستبدال الإلكتروفيلية) طرق تحضير مشتقات الحموض (التحلل المائي)
12	**6**	**Practical:** **Identifying the functional groups in the different categories- studying their reactions.**
14	**7**	**Identifying an unknown organic compound, preparing its derivatives, and writing a report on how to identify it.**

Textbook & Supporting References

Organic Chemistry	**Textbook title**
Hassan Bin Muhammad Al-Hazmy Muhammad Bin Ibrahim Al-Hassan	**Author's Name (main)**
Dar Al-Khergein for Publications	**Publisher**
1423	**Publishing Year**
Practical Organic Chemistry (Part 1)	**Reference (1)**
Hassaan Amin & Al-Hazmy	**Author's Name**
King Saud University	**Publisher**
1407	**Publishing Year**

Form (5)
Brief Module Description

Organic Chemistry (Polymers and Oil)	**Module Title:**
CHME 314	**Module ID:**
CHME 121CHME 211,	**Prerequisite:**
Level 5	**Level:**
3(2+2)	**Credit Hours:**

Module Title:	**Organic Chemistry (Polymers and oils)**
Module ID:	**CHME 314**
Prerequisite:	**Chem. 121, Chem. 211**
Level:	**5th**
Credit Hours:	**3(2+2)**

Module Description

A. Theoretical: **a. Plastics and polymers: Definition of polymers, manufacture and study mechanism of polymerization**
Types of Polymerization: Condensation and addition polymerization. Study of reaction rates
The study of the physical properties with examples of preparation for each of them.
The study of the important physical properties to make use of plastics in real life.
Oil Chemistry **In short what oilis,history, methods of oil formation, its origin and mechanism of formation.**
The flow of oil from its original positions to its current sites and methods of its exploration, the role of geochemistry in its exploration, and extraction and refining methods.
Uses of oil as a source of energy, petrochemical industries and fractional distillate of oil and its uses.
Practical: **Soap and detergent manufacturing and preparation of some polymers.**

Module Aims

1	**Student gain knowledge of an outline of the chemistry and polymer technology, basic principles of the polymerization process and the technical conditions used in the polymerization processes, as well as the physical, chemical and thermal properties of polymers.**
2	**Training the students in oil, petroleum and petrochemical industries.**

Learning Outcomes

1	**Knowledge to be acquired:** **-Identifying what the polymerization process is.**

	-Identifying the technical conditions used in the polymerization processes. **-Identifying the physical chemical and thermal properties of polymers.** **- Identifying oil, petroleum and petrochemical industries.**
2	**Interpersonal Skills & Responsibility:** **-Solving some exercises in groups.** **-Doing aresearch as a group.**
3	**Communication, Information Technology, Numerical** **1. Calculating the products/ results percentage.** **2. Using chemical Internet sites.**

Course Content

(Hours)	(Weeks)	List of topics
2	**1**	**Theoretical:** Plastics and polymers: Definition of polymers, manufacture and study mechanism of polymerization.
4	**2**	Types of polymerization: condensation and addition polymerization and study of reaction rates.
4	**2**	The study of the physical properties with examples of preparation for each of them.
2	**1**	The study of the important physical properties to make use of them in real life. **Mid-term exam**
4	**2**	**Oil Chemistry:** In brief, what oil is, history, methods of oil formation, its origin and mechanism of its formation.
4	**2**	The flow of oil from its original positions to its current sites and methods of its exploration, the role of geochemistry in its exploration, and extraction and refining methods. …oil in the Kingdom of Saudi Arabia.
6	**3**	Uses of oil as a source of energy, petrochemical industries and fractional distillate of oil and its uses.
26	**13**	**Practical:** Soap and detergent manufacturing and preparation of some polymers. -Checking the notes books (practical part)
2	**1**	Soap cakes with …, honey and almonds

		قرفة
2	**1**	Babbong soap
2	**1**	Mint soap
2	**1**	Liquid soap
4	**2**	تحضيرنوفولاك من الفورمالدهيدوالفينول
2	**1**	تحضيررر يوريا فورمالدهيد
2	**1**	**Mid - term Exam**
2	**1**	تحضير نايلون ٦٦
2	**1**	تحضير نايلون ١٠،٦
2	**1**	تحضير الداكرون
2	**1**	تضير بولي استيرين
2	**1**	بلمرة الاكريلونتريل

Textbook & Supporting References

The Foundations of Stereochemistry and Organic Polymers	**Textbook title**
Abdullah Hijazi, Salem bin SulayemThiyabi	**Author's Name**
King Saud University	**Publisher**
	Publishing Year
Petroleum and petrochemical industries	**Reference (1)**
Salem bin SulayemThiyabi	**Author's Name**
King Saud University	**Publisher**
1997	**Publishing Year**

Form (5)
Brief Module Description

Organic Chemistry (Organic Compounds Spectra)	**Module Title:**

CHEM 423	**Module ID:**
CHEM 211 Organic Chemistry,	**Prerequisite:**
Level Eight	**Level:**
4(3+2)	**Credit Hours:**

Module Title:	**Organic Chemistry(Organic Compounds Spectra)**
Module ID:	**CHEM 423**
Prerequisite:	**CHEM 423**
Level:	**8th**
Credit Hours:	**4(3+2)**

Module Description

Electromagnetic radiation spectrum
Ultraviolet (UV) and visible spectra (Vis)
IR spectra: Absorption of functional groups and applications in organic chemistry
All types of nuclear magnetic resonance spectra. Identification of some functional groups
Mass spectra of common organic compounds: hydrocarbons, aldehydes, ketones, carboxylic acids and its derivatives, amines, alcohols, and phenols.
Identification of organic compounds using All types of spectra

Module Aims

1	**Identify the principles of spectrum.**
2	**(Identify the different types of spectrum: UV(,) Vis) , IR, NMRandmass.**
3	**Identify organic compounds using spectrum.**
4	**Training in practical ways for different spectrum measurements.**

Learning Outcomes

Knowledge:	١

-Using UV spectra in the identification of organic compounds. -Using IR spectra in the identification of organic compounds. - Using NMR spectra in the identification of organic compounds. -Using mass spectra in the identification of organic compounds. -Using all types of spectra in the identification of an unknown organic compound.	
Cognitive skills: Identification formulas of some unknown organic compounds through their spectrum.	٢
Interpersonal Skills& Responsibility - Solving some exercises in groups. **-**Doing aresearch as a group.	٣
Communication, Information Technology, Numerical	
- Calculating some absorbance values of organic compounds in the UV spectrum. - Using chemical Internet sites.	٤

Course Content

(Hours)	(Weeks)	List of Topics
4	**1**	Electromagnetic radiation spectrum
8	**2**	Ultra violet and visible spectra
8	**2**	IR spectra: Absorption of functional groups, and applications in organic chemistry
16	**4**	All types of nuclear magnetic resonance spectra. Identification of some functional groups.
8	**2**	Mass spectra of organic compounds: hydrocarbons, aldehydes, ketones, carboxylic acids and its derivatives, amines, alcohols,and phenols
8	**2**	Identification of organic compounds using all types of spectra.
26	**13**	**Practical:**
6	**3**	Identification of some organic compounds using UV spectra , visible (Vis), infrared spectra IR, NMR and Mass Spectrometry.
6	**3**	Identification of some organic compounds using infrared spectra IR.
2	**1**	**Mid-term Exam**
6	**3**	Identification of some organic compounds using **H^1NMR**.

6	**3**	Identification of some organic compounds using Mass Spectrometry.

Textbook & Supporting References

The Basic Principles in the Spectra of Organic Compounds	**Textbook title**
Hassan Mohammed al-Hazmi, Salem SchoemanAlchwimman	**Author's Name**
Khuraiji Library	**Publisher**
1986	**Publishing Year**
Spectra Metric Identification of Organic Compounds:	**Reference (1)**
Silverstein and G. GaytonBassler	**Author's Name**
John Wiley and Sons,Inc New York,London	**Publisher**
1994	**Publishing Year**

Form (5)
Brief Module Description

Physical Organic Chemistry	**Module Title:**
CHEM 223	**Module ID:**
CHEM 211Organic Chemistry (2)	**Prerequisite:**
Level Four	**Level:**
2	**Credit Hours:**

Module Title:	**Physical Organic Chemistry**
Module ID:	**CHEM 223**
Prerequisite:	**CHEM 211**
Level:	**4th**
Credit Hours:	**2**

Module Description

Electronic effects and free energy relations (Hammat&Taffet equations)

Physical and chemical methods to know a given reaction (study of reaction products, study of reaction kinetics (order), detection of reaction intermediate, carbonium, carbanion, free radical, addition intermediate that has a pyramid quartet form.
Physical and chemical methods to recognize a given mechanism that includes study of electronic effects for replaced groups (resonance , up conjugation , stereochemistry, use of isotopes, sort of catalyst)

Module Aims

1	**To identify free energy relations (Hammat&Taffet equations)**
2	**Training in applications in the field of the study of electronic effects of replaced groups.**

Outcomes

Knowledge to be acquired: - To identify relations between electronic effects of replaced groups and free energy. To identify Hammat and Taffet equations. - To identify physical and chemical methods to know one given reaction results (study of reaction products, study of reaction kinetics (order), detection of reaction intermediate (carbonium, carbanion, free radical, addition intermediate that has a pyramid quartet form,and aryene intermediate.	١
Cognitive Skills to be acquired: - To be able to apply some conclusions. - To be able to write equations of reactions under study.	٢
Interpersonal Skills & Responsibility: - -Solving some exercises in groups. - - Doing aresearch as a group.	٣
Communication, Information Technology, Numerical: -Using chemical Internet sites anddoing some calculations.	٤

Course Content

(Hours)	(Weeks)	List of topics

12	**6**	**Electronic effect and free energy relations (Hammat and Taffet equations)**
8	**4**	**Physical and chemical methods to know a given reaction (study of reaction products, study of reaction kinetics (order), detection of reaction intermediate, carbonium, carbanion, free radical, addition intermediate that has a pyramid quartet form.**
8	**4**	**Physical and chemical methods to recognize a given mechanism that includes study of electronic effects for replaced groups (resonance , up conjugation , stereochemistry, use of isotopes, sort of catalyst)**

Textbook & Supporting References

Physical Organic Chemistry	**Textbook title**
Abdul Aziz Mohiuddin Khoja, Ahmed Sami Abdul ShakoorHwala,	**Author's Name**
King Abdul Aziz University	**Publisher**
1985	**Publishing Year**
Mechanics of Organic Reactions	**Reference (1)**
Salim Bin Shuiaman, et.al.	**Author's Name**
King Suad University, Riaydh, Library Affairs Deanship	**Publisher**
1987	**Publishing Year**

Vice rectorate for Academic Affairs

FORM (5)

Brief Course Specification

Module Title:	**Instrumental Analysis Chemistry**
Module ID:	**Chem411**
Prerequisite:	**Quantitative Analytical Chemistry, chem315**
Level:	**7th Level**
Credit Hours:	**4(3 theoretical +2 practical)**

Module Description

Identifying electrochemical analysis including: voltemetric, cholometric and amperometric methods. Furthermore, studying several methods of spectrochemical and
Chromatography analysis, and identifying their types and principles.

Module Aims

Guiding analysts to the best way to take advantage of chemical analysis devices, and identifying the theoretical foundations that operate these devices. In addition, giving a practical guidance on how these devices work.	١
Identifying several electrochemical analysis methods.	٢
Identifying different spectrochemical analysis methods.	٣
Identifying several chromatography analysis methods.	٤

Learning Outcomes:

Students will be able to identify the concept, types, and basics of Instrumental analysis chemistry.	١

Students will be able to differentiate between electrochemical and spectrochemical analysis, and the way each is analysed.	٢
Students will be able to conduct various experiments using different voltagemethods in Labs	٣
Students will be able to differentiate among types of chromatography analysis and its principles	٤

Course Content

(**Hours**)	(**Weeks**)	(**Subjects**)
١٢	٤	**Introduction to electrochemical analysis including; voltage, chromatographical, and weighing analysis methods.**
١٢	٤	**-Voltemetric and amperometric criteria**
٦	٢	**–Introduction to spectrochemicalmethods including visible spectroscopy methods.**
٣	١	**–Methods of molecular spectrochemical**
٣	١	**Methods of atomic spectrochemical.**
٦	٢	**– Introduction to chromatography and distribution coefficient.** **– Methods of chromatographic diffusion to columns, and gas chromatography.**

Required Textbook and References:

Instrumental method of analysis	**Textbook title**
Horbort H. Williard	**Author's Name**

D.V an Nostrand company N.Y	Publisher
1981	Publishing Year
Analytical Chemistry: Instrumental Anlysis	Reference (1) (Arabic Reference)
Alzamel I. Zalmel	Author's Name
Alrajhy Library	Publisher
1996	Publishing Year

Vice rectorate for Academic Affairs

FORM (5)

Brief Course Specification

Module Title:	Quantum Chemistry (1)
Module ID:	Chem222
Prerequisite:	N/A

Level:	**Level 4**
Credit Hours:	**2 Theoretical**

Module objectives

Identifying the most important theories in the twentieth century; especially the one of quantum that is based on the principle of probability.	١
This theory led to the quantization of energy and momentum and tied the wave movement and particle.	٢
Describing the movement of fine particles to prepare for the study of particles and molecules movement.	٣

Learning Outcomes:

Studying the course of quantum chemistry (1) by using methods for resolving chemical systems, both atomic and molecular.	١
providing students with more information about the old quantum theory and the emergence of the modern one through materialistic waves.	٢

Course Content

(**Hours**)	(**Weeks**)	**Subjects**
٢	٤	**Part One**: **1. Introduction to deficiency of classical mechanism and electromagnet theory in explaining some physical and chemical phenomena**. **2. Elementary assumption of quantum theory**
٢	٥	**Part two: emergence of modern quantum theory through materialistic waves**:

		1. Dual property of a particle, wave, and wavy length according to Brolly. 2. Hezeberg's uncertainty principle and its applications: wavy function accompanying particle movement. 3. Influential factors on quantum mechanism (its properties, types, and processes) and eigen–wavy functions. 4. Quantum mechanism based on (3) including some theories of replacing (exchanging) and non–replacing factors, medial value, collection of eigen –functions, functions symmetry condition.
٢	٥	Part three: Using Schrodinger's independent time equation in the computation of Eigen–functions systems. 1. Movement of free particle in one dimension in comparison with (part one): Wilson and Summerfield's. quantization principle, 2. Simple symmetrical movement "conception of Hamilton's factor. 3. Particle movement of pressure, and studying elementary conditions of the system. 4. Particle movement in three dimensions as a generalization of particle movement in one dimension in order to identify the analysis principle called " Degeneracy".

Required Textbook and References:

Quantum Chemistry	Textbook title
Almubarak, R & Khalil, M	Author's Name
Alkharijy for publishing	Publisher
1417 H	Publishing Year
Principles of Quantum Chemistry	Reference (1)

Khalil, S	Author's Name

Vice rectorate for Academic Affairs

FORM (5)

Brief Course Specification

Module Title:	**Quantum Chemistry (2)**
Module ID:	**Chem311**
Prerequisite:	**Quantum Chemistry (1) Chem222**
Level:	**Level 5**
Credit Hours:	**2 Theoretical**

Module Description

Studying different approximation methods: the way of change – expansion change method to include raised cases. **Jamming theory of cases is now defunct jamming theory treatment of the ground state of the helium atom** **Angular momentum of the complex electrons atoms .** **Hekel's method to describe the structure of the molecular orbitals.** **Application on the hydrocarbons orbitals of dual bonds.**

Module Aims

Training students to think and develop their skills through defining ways of analyzing chemical atomic systems and molecular ones, whether it is a complete solution for atoms containing one electron or an approximate solution to the atoms and molecules that contain more than one electron.	١
Students gain more information to solve these systems to calculate both the total energy and the atomic and molecular wave functions.	٢
Acquaint students with an introduction to the theory of groups to facilitate the study of symmetric and asymmetric systems.	٣

Learning Outcomes

The ability to think and develop their capabilities and imagination skills and linking quantum to inorganic chemistry in order to study advanced courses in this area.	١
providing student with necessary scientific skills to develop their professional performance.	٢

Course Content

(**Hours**)	(**Weeks**)	(**Subjects**)
٢	٤	**Part I:**

		Complete solution of hydrogen atom. The type of voltage with the conclusion of eigen–wave functions ,eigen–values , numbers of different quantity of the electron , calculation of movement amounts, and the calculation of the angles between the various vectors. And also between the rules of electron transmission from an orbit, according to these quantitative numbers with applications.
٢	٤	**Part II:** **Approximate methods to solve the Schrödinger equation, including:** **A. "Turmoil" through the Hamilton's factor for the helium atom, which contain more than one electron.** **B. Method of variationfrom application "particle free movement in a box"** **C. Confusion/turmoil" method " Jamming theory" independent of time with the application to calculate each of the wave functions and eigen–values of self–troubled system until the first class.**
٢	٥	**Part III :** **A.Pauli exclusion principle with the application of "the helium atom" system to conclude** *Symmetric eigen functions* **and** *antisymmetric eigen functions* **with a generalization on systems that contain more than two electrons, considering which kind of** *eigen functions* **can be ruled out** **.B.***Valence Bond* **to conclude eigen functions and eigen values for some chemical systems such as ion molecule of hydrogen in a change model** **c.** *Molecular orbital Theory* **to the conclude eigen values and functions of self–atomic and molecular orbitals of some chemical systems such as hydrogen molecule and ion**

		molecule hydrogen as applications on multiple atoms (in a manner of change **D.comparing the bond valence theory and molecular orbitals in terms of hamiltonian factor– eigen functions with application to molecular hydrogen system.** **H.approximation of structure and its applications in the calculation of the hamiltonian factors "effects" ,the eigen wave functions and eigen values of self–multiple atoms of molecules**
٢	٢	**Part IV:** **A. Symmetry in molecules and the types of symmetry– definition of the theory of groups.** **B. Symmetry elements – symmetry operations with applications**

Required Textbook and References:

Quantum Chemistry	**Textbook title**
AlMubarak, R. & Khalil, M	**Author's Name**
al khuriji publishers	**Publisher**
	Publishing Year
group theory for chemists	**Reference (1)**
Defidson, G . translated by Khalil, M. King Saud University	**Author's Name**
king Saud printing press	**Publisher**
١٩٩٤	**Publishing Year**

Vice rectorate for Academic Affairs

FORM (5)

Brief Course Specification

Module Title:	**Inorganic Chemistry(Transition elements)**
Module ID:	**Chem. 322**
Prerequisite:	**Chem. 122**
Level:	**Level VI**
Credit Hours:	**4 theoretical**

Module Description

Introducing the students to the basic and internal transition elements along with their position in the periodic table and their different uses and characteristics (Physical, chemical).

Module Aims

Study the properties of transition elements.	١
Study the properties of internal transition elements in the light of periodic of these elements in the periodic table.	٢

Identify the theories of electronic bonds of the complexes	٣

learning outcomes :

Provide the student with the basic concepts of the chemistry of transition elements in a way that makes her more understanding and knowledge of the importance of these elements in our life..	١
How the complexes are coordinate by studying the various theories that explain the coordination, and this plays a crucial role in preparing the students to study advanced courses in this area and giving them the necessary scientific skills to develop their professional performance.	٢
The students' ability to learn atomic weights and numbers of each component used in the preparations of organometallic compounds.	٣
Improve the students' capacity to be self–reliance in solving problems encountered during the study of the course and other courses related to this course.	٤

Course Content

(Hours)	(Weeks)	(Subjects)
٤	٣	First: the importance of the transition elements, the definition of transitional element, the site of the transition elements in the periodic table, the mass elements, the first, second, and the third transitional chains, mass elements (lanthanides and actinides), the difference between the elements of the two masses, the difference between the first transitional chain elements and elements of the mass properties feature the metallic electro–wave elements of the first transitional chain,

		multiple ionization , cases of oxidation, the volume of complexes formation.
٤	٣	Second, a simplified introduction of crystal field and valence bond theories ١. Color property . ٢. Para magnetic . ٣. Catalysis property . ٤. The composition of proportional compounds . ٥. preparing alum. ٦. Comparison of the properties of the two chains with reference to the lanthanide shrinking
٤	٤	Third, a comparison study to metals in their collections (taking into account the application of the basic properties of the above). A. Group, scandium, Alitiriom, electronic structure of two, scandium oxides and halides and some of its complexes B. Lanthanides and actinides, the presence and . the electronic structure, oxidation states, Lanthanides and actinides shrinking, the difference between Orbitals, magnetic properties, color, chemistry of the elements of lanthanides and actinides (1) The composition of oxides and hydroxides (2) halides (3) Double salts (4) complexes (5) atomic number and basal property. C. Absorption spectra of the lanthanides and actinides – Methods of separation of lanthanides, actinides preparation, elements of the post-actinides and give a picture of the periodic table contains post-Lawrencium

		.hypothetical elements
٤	٤	**Fourth: the study of the elements of the rest of the groups in terms of presence, extraction, electronic structure, atomic radius, Ionic radius, ionization voltage, states of oxidation, oxides, halides, sulphides, binary compounds with non–metals, some groups are complexes of titanium group, vanadium group, chrome set, manganese, Group H, iron cobalt, nickel, platinum metals, copper group**

Required Textbook and References:

basic transition elements and coordination chemistry	**Textbook title**
Abdelfattah, H. & Abu–Qasem, S.	**Author's Name**
Daralnashir publishing house	**Publisher**
١٤٣٣هـ – ٢٠١٢م	**Publishing Year**
inorganic chemistry textbook	**Reference (1)**
Ahyohy, J. Translated by Alhwadly , H.	**Author's Name**
The Jordanian Academy of Arabic Language	**Publisher**
١٤٠٤هـ – ١٩٨٣ م	**Publishing Year**

Vice rectorate for Academic Affairs

FORM (5)

Brief Course Specification

Module Title:	**Coordination Chemistry**
Module ID:	**Chem324**
Prerequisite:	**Inorganic Chemistry (transition elements) Chem322**
Level:	**Level VII**
Credit Hours:	**2 theoretical**

Module Description

Identification of coordination compounds and their various theories and the approach to concept for the stability constants formed. A theoretical and practical study of coordination compounds in terms of their methods of preparation and properties and the various theories to form complexes.

Module Aims

Study the theories of chemical bonds in the complexes.	١
Study the absorption spectra and magnetic properties of coordination compounds.	٢

:learning outcomes

providing students with the basic concepts of coordination compounds and this makes them more understanding and knowledge of the importance of these compounds in our life.	١
Studying How the complexes are coordinate through the study of the various theories that explain the coordination to enable them to .	٢

study advanced courses in this area. Moreover, providing them with scientific and practical skills required to develop their Professional Performance.	

Course Content

(Hours)	(Weeks)	(Subjects)
٢	١	**First: the theories of chemical bonds for coordinate compounds:** **the Definition of coordinate compounds (complexes)**
٢	٢	**Werner theory: the definition of the theory, preparation of coordination, naming of coordinate compounds, similarities and types, ligands, types of unilateralism ligands, canine ligands (chelated)**
٢	٢	**Valence bond Theory: magnetic evidence – success and failure (deficiencies)**
٢	٤	**Crystal field theory: the electrostatic account of the coordinate bond** **.the Splitting of the metallic ion orbitals in the crystalline field of eight and quad–faceted –measurement of the amount of crystal field energy and the factors that affect it** **– .Magnetic properties, according to the theory of crystal field – cases of high and low spinning – strong and weak stability Energy of the crystal field** **– .The Jahn–Teller effect and the distorted spatial eight–faceted shape, and even spatial quad–faceted shape**
٢	٢	**Theory of molecular orbital: symmetric orbital – – complexes containing σ bond – complexes containing π bond and measuring the impact of π bond– deficiencies of theory**

٢	٥	**Electro–spectrum for complexes oftransitional elements ions.** **Introduction to various electronic transitions.** **Spectrum resulting from the coordinate groups:** • **Energy levels of transitional elements ions.** • **Dualityof orbital ……** • **Duality ofspinal ……..** • **Duality of Russell– Saundr.** • **Cases of Russell – Saundr.** • **Gap definition.** **• Deficiencies in the crystal field.** **•Extended electronic cloud phenomenon.** **• Neflokestininfluence andNeflokestin ratio** • **The mutual influence of the electronic–shape.** • **• Alligandfield theory.** • **• Alligand field measurements.** • **Orgelcurves** • **Applications to use Orgel diagrams to explain the absorption spectrum fortransitional elements compounds.** • **Spinal selection rules.** • **Orbital selection rules.** **Absorption spectrum of nickel compounds, • vanadium, manganese, cobalt, chromium, and copper**
		practical العملي
٣	٣	**Preparing** $[Cu(NH_3)_4]SO_4.H_2O$ **compounds and the analyzing its components (copper, ammonia and sulfate)**
٣	٢	**Preparing a number of amines cobalt complexes – Werner complexes such as**

		$[Co(NH_3)_4Cl_2]Cl, [Co(NH_3)_5Cl]Cl_2, [Co(NH_3)_3Cl_3]$ and $[Co(NH_3)Cl_3]$
٣	٣	**Preparing $[Ni(NH_3)_6]Cl_2$ and $[Ni(en)_3]Cl_2$ where "en" is a di–amine ethylene.** **1. Comparing proceeds of overlapping compounds and setting a fixed value for them.** **2. Nickel analysis in the two compounds.**
٣	٣	**Preparing a number of metal compounds with some ligandslike Astel Osteon – oxalic acid – Schiff rules.** **–Purification of formed compounds by recrystallizationmethod.**
٣	٣	**The study of electronic absorption spectra to the following: (according to the possibilities)** **1. (Eight–facetedion $[Co(H_2O)_4]^{2+}$ four–faceted ion $[CoCl_4]^{2-}$ and making a comparison between them in terms of absorption coefficient values and crystalline fission values.** **2. $[Mn(H_2O)_6]^{2+}$ ion as an example of d^5 system and the application of Orgel curve .** **3. $[Cu(H_2O)_6]^{2+}$ ion as an example of d^5 system and the application of Orgel curve.**

Required Textbook and References:

Basic transition elements and coordination chemistry	**Textbook title**
Muhammed, H. & Abu–Qasem, S.	**Author's Name**
Dar Alkharijy for publishing and distribution	**Publisher**
.....	**Publishing Year**

Vice rectorate for Academic Affairs

FORM (5)

Brief Course Specification

Module Title:	**Physical chemistry (phase rule)**
Module ID:	**CHEM 212**
Prerequisite:	**General Chemistry chem. 111**
Level:	**Third level**
Credit Hours:	**2 (one theoretical and two practical hours) a week**

Module Description

Studyingthe basics of the phase rule by defining Phase, component, Fluency degree, and the real equilibriumand applying it to a one–component system,two–component system, and multi–component system.

Module Aims

Identifying the basics of phase rule	١
Recognizingmono–component system	٢
Recognize double–component system	٣
Recognizing multi–component system	٤

Learning Outcomes:

Student will be able to understand the basics of the phase rule	١
Distinguish between mono–component system, double–component system, and multi–component system. And understanding metaphase charts of each type	٢
Using the phase rule to determine the number of components, phases, degrees of fluency of various systems	٣
Practically study ingmono, double and tri–component system	٤

Course Content

(Hours)	(Weeks)	(Subjects)
٣	٣	**Definingand making a comparison among material states, equilibrium types. Identifying system, phase, component, fluency degrees, and phase equation derivation**
٤	٤	**Studying mono–component systems (water, sulfate), studying two–component systems (solid compounds equilibrium with gas, and liquid–liquidequilibrium)**
٣	٣	**Intensive systems**

٤	٤	**Fully–mixingsolid solutions systems, solid solutions limited–mixing, and tri–component systems.**
٢٨	١٤	**Practical : The relationship between solubility of limited–mixingliquids** **–Setting the boiling point of binary systems** **– Setting theAmmonia distribution coefficient between chloroform and water** **Applying phase rule on a three–component systems**

Required Textbook and References:

General Chemistry	**Textbook title**
AlAwady, A.	**Author's Name**
Dar Hafez for publishing and distribution	**Publisher**
1989	**Publishing Year**
Phase equilibrium and phase rule.	**Reference (1)**
Barakah, A.	**Author's Name**
Dar Al–NasherAldawly	**Publisher**
1424 H	**Publishing Year**

Vice rectorate for Academic Affairs

FORM (5)

Brief Course Specification

Module Title:	**Electro–Reversible Chemistry 1**
Module ID:	**Chem. 225**
Prerequisite:	**General Chemistry chem. 111**
Level:	**Level Four**
Credit Hours:	**3(two theoretical and two practical hours)**

Module Description

Electrical conductivity , reversible electrochemical processes, types of poles , types of cells, measurement applications of E.D.F

Module Aims

Defining electrical conductivity	١

Recognizing reversible electrochemical processes	٢
Identifying types of poles	٣
Recognizing absolute and relative potentials	٤
Identifying types of cells	٥
applications of E.D.F Measurements	٦

Learning Outcomes:

Identifying the basics of electrochemistry	١
Understanding (electrical conductivity reversible electrochemical processes, types of poles , types of cells, measurement applications of E.D.F)	٢
Rule application to solve problems	٣
Connecting theoretical and practical materials.	٤

Course Content

(Hours)	(Weeks)	(Subjects)
٦	٣	**Electrical conductivity, Faraday's rules–Arrhenius theory, measuring electrical conductivity and its applications, changing conductivity with concentrationand viscosity**
٦	٣	**Reversible Electrochemical processes, E.D.F, measuring cells, the influence of concentration and temperature on the driving force, Nernst's equation and poles potentials**
١٠	٥	**Poles types, Relative and absolute potentials of poles and electrochemical chain**
٨	٤	**Types of electrochemical cells, measurement applications of driving force and poles potentials**
٢٨	١٤	**Practical: Solubility measurement using conductivity**

		- **Calibration using conductivity** - **Measuring E.D.F and determining standard potentials.** - **Measurement of oxidative and reduction potentials**

Required Textbook and References::

Electro–chemistry , electrolytic electrical conductivity and galvanic cells	**Textbook title**
Alawais, A.	**Author's Name**
Dar AlKuraijy for publishing	**Publisher**
1995	**Publishing Year**
The foundations of Physical Chemistry	**Reference (1)**
Jarrar, A.	**Author's Name**
Dar AlFajer for publishing	**Publisher**
2004	**Publishing Year**

Vice rectorate for Academic Affairs

FORM (5)

Brief Course Specification

Module Title:	**Chemistry of organic reactions mechanisms**
Module ID:	**CHEM422**
Prerequisite:	**CHEM 121, CHME 211**
Level:	**8th**
Credit Hours:	**2**

Module Description

Nucleophilic substitution reactions on saturated carbon atom.
Nucleophilic and electrophonic substitution reactions on aromatic compounds.
Elimination reactions and the factors that affect them
Addition reactions on the binary bond (carbon–carbon).
Addition toreciprocal double–bonds
Addition to carbonyl group
Adjusted(rearrangement) reactions

Module Aims

Identifying the basics of stereochemistry.	١
Establishing rules and methods of various organic reactions mechanisms , and stating the relationship between stereochemistry and reaction mechanics	٢
Training on some applications in the field of organic reactions Mechanics	٣

Learning Outcomes:

- Description for knowledge to be gained: **– Identifying the mechanics of nucleophilic substitution reactions on saturated carbon atom.** **- Identifying the mechanics of electrophilic and nucleophilic substitution reactions on aromatic compounds.** **–Identifying elimination interactions and the factors that affect them.** **- Identifying addendum interaction mechanics to binary bonds.** **- Identifying addendum mechanics to the reciprocal double–bond (carbon–carbon).** **– Identifying addendum interaction mechanics with the carbonyl group.** **– Identifying adjusted (rearrangement) reactions mechanics**	١
Description of cognitive skills to be gained: **1. The ability to apply some conclusions** **2.The ability to deduce some mechanisms**	٢
Interpersonal Skills and Responsibility: **Working in groups to attempt some exercises** **– Working in groups to conduct a research**	٣

Communication, Information Technology and Numerical Skills: –Using chemical Internet sites and doing some calculations	٤

Course Content

(Hours)	(Weeks)	(Subjects)
٤	٢	**Substitution reactions of nucleophilic on saturated carbon atom.**
٦	٣	**Electrophilic and nucleophilic substitution of aromatic compounds.**
٤	٢	**Elimination interactions and the factors that affect them.**
٦	٣	**Addendum interactions to binary bonds (carbon–carbon).**
٤	٢	**Additionto the reciprocal double–bond (carbon–carbon).**
٤	٢	**Addition to carbonyl group**
٢	١	**Adjusted (rearrangement) reactions**

Required Textbook and References::

Mechanics of Organic Reactions	**Textbook title**
Shwiman, S. et.al	**Author's Name**
King Saud University, Riyadh "Deanship of Library Affairs	**Publisher**
1987 / 1407	**Publishing Year**
Mechanisms of organic chemistry"	**Reference (1)**
H. Maskil	**Author's Name**
Oxford University .Walton Street OX 26 DP	**Publisher**

1996	Publishing Year

Vice rectorate for Academic Affairs

FORM (5)

Brief Course Specification

Module Title:	**Kinetic Chemistry**

Module ID:	**(412 Chem)**
Prerequisite:	**Thermodynamic chemistry 312**
Level:	**Level seven**
Credit Hours:	**3(Two Hours Theoretical + Three Hours practical)**

Module Description

Kinetic Chemistry(412 Chem)\ Seventh Level \Two Hours Theoretical + Two Hours practical

Module Aims

Identifying Kinetic and classification Of chemical reactions	١
Determining a speed rate of chemical reactions	٢
Linking theoretical& practical materials through labs experiments	٣
Studying rate of chemical reactions and the influential factors	٤
Studying reactions mechanic and side and anti–interactions	٥

Learning Outcomes:

Applying the theoretical material through the practical one	١
Trying to figure out the problems in the practical material and their solutions.	٢
Encouraging students to work in groups at Labs in special research in the practical material, to be responsible for work and their personal relationship in classifying solutions and materials	٣
Identifying kinetics of chemical reactions and their classifications	٤
Setting a speed rate of chemical reactions	٥

Course Content

(Hours)	(Weeks)	(Subjects)
٤	٢	**Identifying kinetic chemistry, speed rate of reactions, particles kinetic, rank of chemical reaction,its typesand examples**
٤	٢	**Speed reaction rule, setting the rank of reaction and practical issues.**
٨	٤	**Applications on types ofreaction ranks**
٨	٤	**Complex reactions, the effect of temperature, activation energy, theories that explain the occurrence of chemical reactions**
٤	٢	**Examples and comprehensive issues on kinetics**
٣٠	١٥	**Practical: 1– Setting the speed of chemical reactions** **first rank – second rank** **1.Studying the effect of concentrating on the speed of the reaction and determining of the rank** **Studying the effect of temperature on reaction speed and determining activation energy**

Required Textbook and References::

Kinetic Chemistry	**Textbook title**
Reda, S.	**Author's Name**
Faculty Of Science – King Saud University – The Frist edition	**Publisher**
1974 –	**Publishing Year**
Chemical kinetics and reaction mechanics	**Reference (1)**
Al–Khuwaiter, S.	**Author's Name**
Dar Al–Fajer	**Publisher**
1998	**Publishing Year**

Vice rectorate for Academic Affairs

FORM (5)

Brief Course Specification

Module Title:	**Thermodynamic Chemistry**
Module ID:	**CHEM 312**
Prerequisite:	**(CHEM 111) General Chemistry(1)**
Level:	**Level Five**
Credit Hours:	**Three Hours Theoretical + Two Hours practical**

Module Description

Thermodynamic Chemistry(211 Chem)\ Three Hours Theoretical + Two Hours practical\ Fifth Level

Module Aims

Identifying properties of thermal material in nature	١
Studying various thermal systems of material in nature	٢
Linking theoretical& practical materials through labs experiments	٣
Studying thermodynamic basics and its applications in chemical processes	٤

Learning Outcomes:

Applying the theoretical material through the practical one	١
Trying to figure out the problems in the practical material and their solutions.	٢
Encouraging students to work in groups while in Labs; especially, in research of the scientific material. Furthermore, encouraging them to be responsible for their work and their personal relationship.	٣
Acquainting students with the thermal properties of material in nature	٤
Studying various thermal systems where material is limited in nature	٥

Course Content

(Hours)	(Weeks)	(Subjects)
٦	٣	-Introduction to Thermodynamics , the system and its properties, equilibrium and types, the first law of thermodynamics and applications, heat content and its types and applications.

٢	١	**– thermal capacity, its types and the relationship between thermal capacities and other issues.**
٦	٣	**–Joule Thomson'seffect and other practicalissues, the second law of Thermodynamics, Carnot cycle and efficiency of Carnot machine.**
٨	٤	**Clauzs and Klvin's logic, entropy, entropy change in inverse operations and practical issues**
٤	٢	**The third law of thermodynamics and absolute entropy – free energy under pressure and temperature.**
٢	١	**Gibbs equation and practical issues**
٣٠	١٥	**- Practical:** **– Determining of thermal capacity of the calorimeter** **– Settingthe equalizer temperature for acid with base** **– The relationship between solubility and temperature and calculating the melting temperature** **– Determiningthe meltingtemperature of Potassium Nitrate salt** **– Determining solution temperature at infinite dilution** **– Determiningsulfuric acid dilution temperature** **– Determiningsilver chloride deposition temperature** **– Prove the validity of Hess's rule** **– Determiningequilibrium constant through distribution method between two unmingled liquids**

		– Determiningsolubility outcomes for sparingly soluble salt and studying the common ion effect

Required Textbook and References::

Chemical Thermodynamics	**Textbook title**
Al–Khuwaiter, S.	**Author's Name**
Dar Al–Fekker Al–Arabi	**Publisher**
2002	**Publishing Year**
Physical Chemistry in KineticChemistry and Thermodynamics	**Reference (1)**
AbuAl–Majd, A.	**Author's Name**
Dar Al–Fekker Al–Arabi	**Publisher**
2001	**Publishing Year**

Vice rectorate for Academic Affairs

FORM (5)

Brief Course Specification

Module Title:	**Physical Chemistry (Surfaces, Colloid s & Catalysis)**
Module ID:	**Chem 316**
Prerequisite:	**-----**
Level:	**Level five**
Credit Hours:	**Two Hours Theoretical + Two Hours practical**

Module Description

Physical Chemistry (Surfaces, Colloid s & Catalysis) (316 Chem)\Three Hours Theoretical + Two Hours practical

Module Aims

providing the students with the basics of Physical Chemistry	١
acquainting the students with classifications of materials and solutions	٢
Linking theoretical& practical materials through lab experiments	٣

Familiarizing students with Chemistry of (Surfaces, Colloid s & Catalysis)	٤
Studying modern Physical chemistry of surface phenomena, Chemical& Physical adsorption, and heterogeneous and homogeneous Catalysis and its applications	٥

Learning Outcomes:

Applying the theoretical material through the practical one	١
Trying to figure out the problems in the practical material and their solutions.	٢
Encouraging students to work in groups while in Labs; especially, when researching the about the scientific material. Furthermore, encouraging students to be responsible for their work and their personal relationship in classifying solutions and materials.	٣
Studying Physical Chemistry (Surfaces, Colloids & Catalysis)	٤

Course Content

(Hours)	(Weeks)	(Subjects)
١٥	٥	the concept of Surface compression and its methods of measurement
٣	١	the concept of Adsorption, types, crooks ,theories and Ionicexchange
٣	١	Adsorptionof Chromatography
١٥	٥	Colloids, categories, types, properties and examples
٦	٢	Catalysis, properties, types and theories

Required Textbook and References::

Principles Of Chemistry Of Surface	**Textbook title**
W Admass& Hassan , A.	**Author's Name**
Azhar University	**Publisher**
1998	**Publishing Year**
Surface and Catalyst Chemistry	**Reference (1)**
Shahata, H.	**Author's Name**
Azhar University – Faculty Of Science	**Publisher**
٢٠٠٤	**Publishing Year**

Vice rectorate for Academic Affairs

FORM (5)

Brief Course Specification

Module Title:	**Biochemistry 1**
Module ID:	**Chem121**
Prerequisite:	**-----**
Level:	**Level Six**
Credit Hours:	**3(2+2)**

Module Description

This module reviews the basic vital compounds (carbohydrates, lipids, proteins) along with their metabolism and their transformation in the human body.

Module Aims

Acquainting students with Carbohydrates, Proteins and Lipids, in terms of their types, properties and roles.	١

Learning Outcomes:

1- Differentiate among Carbohydrates, Protein and Lipids.	١
2- Identify Carbohydrates, Proteins and Lipids properties.	٢
3- Identify metabolism of Carbohydrates, Proteins and Lipids.	٣
4- Practical detection of Carbohydrates, Proteins and Lipids.	٤

Course Content

(Hours)	(Weeks)	(Subjects)
٤	٢	Introduction to biochemistry and its purposes
٨	٤	Chemistry of Carbs, and their metabolism and absorption
٦	٣	Chemistry of Proteins, and their metabolism andabsorption
٦	٣	Chemistry of Lipids, and their metabolism and absorption
٤	٢	Proteins metabolism
٦	٣	Identifying Carbs (Practical)
٦	٣	Differentiating between mono, bilateral and multi–saccharide(practical)
٤	٢	Identifying Lipids (practical)
٢	١	differentiating between saturated and unsaturated lipid acids (practical)
٤	٢	Identifying Proteins and the distinctive reactions of amino acids (practical)
٤	٢	Identifying a compound that belongs either to Carbohydrates, Proteins or Lipids

Required Textbook and References::

Biochemistry	Textbook title
Attaia, F. & Ibrahim, D.	Author's Name

Al–Roushd Library	Publisher
1428 H / 2007	Publishing Year
Biological chemistry	Reference (1)
Amer, N. & Al–Touraiki, M. et.al	Author's Name
Dar Al–Fekker	Publisher
1430 H / 2010	Publishing Year

Vice rectorate for Academic Affairs

FORM (5)

Brief Course Specification

Module Title:	Biochemistry 2
Module ID:	Chem. 414

Prerequisite:	**Chem321 , Biochemistry1**
Level:	**Level Seven**
Credit Hours:	**3(2+2)**

Module Description

1– Study Enzymes, Hormones and Vitamins as they are linked to Metabolism and its consequences including changes as well as reactions.
2– Study the Nucleic acids, Nucleotides and Minerals needed by human bodies.
3– Study the Biological Fluids(Blood– Urine and Lactose).

Module Aims

1–Aquainting students with Enzymes, Vitamins, Minerals, Hormones and Nucleic acids, in terms of their types and biological significance.	١
2– Identify some Biological fluids(Blood, Urine and Lactose), in terms of their ingredients and biological significance.	٢

Learning Outcomes:

1–Identify Nucleic acids ingredients and how to differentiate among them.	١
2– Identify Enzymes and their significance, with the possibility of classification and the factors affecting Enzymes.	٢
3–Study Minerals (Minor and Major).	٣
4–Study Water and fat–soluble Vitamins.	٤
5–Identify different Hormones inside the Human body.	٥

.6– Identify some Biological fluids (Blood, Urine and Lactose).	٦

Course Content

(Hours)	(Weeks)	(Subjects)
٤	٢	Nuclear acids chemistry, Nucleotides
٢	١	General properties of Enzymes, their significance and names (titles)
٢	١	Enzymes classification, influential factors and enzymatic stimulus
٢	١	The enzyme kinetics and inhibition, the ISO enzyme and accompanying enzyme
٢	١	Hormones and its significance, the glands and their mechanics.
٢	١	Division of hormones (pituitary and thyroid and parathyroid) ,pancreatic gland hormones, sex hormones, adrenal and pituitary gland
٢	١	General properties of vitamins and water–soluble ones
٢	١	Fat–soluble vitamins A, K , E, D
٤	٢	Minor and major minerals
٢	١	Biological fluids (blood and urine), blood components, and its biological functions
٢	١	Biological fluids (lactose)
٤	٢	The influence of Amylase Enzyme on starch, fats and proteins (practical)
٤	٢	The effect of temperature and pH on enzymes
٤	٢	Quantitative measurement of Vitamin C (practical)
٤	١	Measuring Calcium amount as an example for minerals (practical)
٤	٢	Separating blood serum and identifying some ingredients

		of the serum and plasma (practical)
٤	٢	**Quantitative measurement of the lactose in yoghurt (practical)**
٤	٢	**Urine chemistry measurements (practical)**

Required Textbook and References::

Biological chemistry	**Textbook title**
Attaia, F. & Ibrahim, D.	**Author's Name**
Al–Roushd Library	**Publisher**
1428 H / 2007	**Publishing Year**
Biological chemistry	**Reference (1)**
Amer, N. & Al–Touraiki, M. et.al	**Author's Name**
Dar Al–Fekker	**Publisher**
1430 H / 2010	**Publishing Year**

Model (5)

Course Description Summary

Module Title	Organic Chemistry
Module Code	CHEM121
Title and code of a perquisite module	None
Module Level	Second
Credit hours	3 Theoretical + 2 Practical = 4 hours

Module Description

The Module presents the basic concepts of organic chemistry such as molecular orbits, chemical bonds , and the interpretation of the physical behavior of organic compounds on the basis of their polarity .In addition , the module embraces preparation methods, reactions and properties of selected groups of organic compounds as well as their applications.

Module Aims

1. To familiarize students with the kinds of chemical bonds .

2. To familiarize students with preparation methods , reactions and properties of selected group of organic compounds as well as their applications .

3. To identify students with the kinds of bonds between organic compounds.

4. Training students to be able to prepare different organic compounds such as Alkanes and Alkenes.

5. To identify students with the physical and chemical properties of Alkanes and Alkenes.

6. To familiarize students with the optical similarities and the optical activities.

Learning Outcomes

At the end of the semester , students will be:

1. Able to identify the various bonds between the organic compounds .
2. Able to prepare various organic compounds such as Alkanes and Alkenes.
3. Familiar with the physical and chemical properties of Alkanes and Alkenes.
4. Able to understand the optical similarities and optical activities .

Module Content

(Theoretical)

Topic	Weeks	Teaching Hours
A general introduction which includes the following : molecular orbits , chemical bonds , hybridization in Carbon atom (sp – sp2 – sp3) , polarization inorganicmoleculesandinflammatoryeffect, The Initial , Molecular and Structural formulas , Lewis's Acids and bases , types of organic reagents and reactions, effective groups	3	9
Alkanesalkanes(open andcyclic): Their structural composition , classification regulations , and physical properties. In addition to their industrialsource, methods of preparation , their interactions(halogenation, oxidation, nitrification) , their freedomof rotationaboutthe single bond and the study ofspatialconditionsas a result)	3	9
Alkanesandalkenes: Their structural composition,bilateralandtrilateral association Engineering, classification rules , Altmacb(geometric similarity) inalkenes, physical properties, preparationmethods and reactions(electrophilic addition, oxidationof variousfactors), variation inthe bilateral and mutual ties.	3	9
Aromatic compounds: The propertiesandqualities of Benzene,the phenomenon ofswing(Buzz), Kikjuliformula, aromaticpropertyandHückel's rule, classification of Benzene derivatives, industrial sourcesandelectrophilic substitution reactions(ALKYLATION, Acylation, Halogenation, Nitration, Silvana) , Benzene alkyls andtheir interactions,guidancein Benzene monounsaturatedderivatives(ortho, metaandbar), and its impact on theactivationorinhibition ofthe loop.Polycyclicaromaticcompounds (Naphthalene andAnthracene) , classification of theirderivatives and their preparation methods and interactions	4	12
Optical Isomerism – Isomerism	1	3
	14	42

(Practical)

Topic	Week	Hours

-Introducing the means of security and safety in chemical laboratories. - Presenting the tools and devices that are used in organic Chemistry laboratories	1	2
Methods of measuring the physicalconstantsof organic compounds	2	4
-Experimentsin the methods ofseparationand purification oforganic compounds. - Purification of an organiccompoundbycrystallization-by solvent extraction using disstilation	3	6
-The discriminationbetweensaturatedandunsaturatedhydrocarboncompound. -The distinction betweena compositealiphaticandaromatic compound.	2	4
Preparation of some well-knowncompounds such asaspirinandAcetinalid	2	4
The descriptive detection of elements (Lassen Experiment)	3	9
	12	24

Recommended textbooks and supplementary references

Recommended textbook	Organic Chemistry
Author's name	Dr. Alhazmi ,Hassan Muhammed Dr. Alhassan ,MuhammedIbraheem
Publishing Year	2000
Reference 1	Aliphatic Organic Chemistry
Author's Name	Hijazi , Abdullah
Publisher	King Saud University - Deanship of Library Affairs
Publishing Year	1988

Model (5)

Course Description Summary

Module Title	Electro-Reversible Chemistry 2
Module Code	CHEM323
Title and code of a perquisite module	Electro-Reversible Chemistry 1
Module Level	The sixth
Credit hours	3 Theoretical + 2 Practical

Module Aims

1. Acquaint students withthechemical reactionsofvarious materialsunder electric field.
2. Linking between the theoretical side of the module and the practical one by conducting laboratory experiments.

Learning Outcomes

At the end of the semester , students will be :

1. Able to apply the theories in the laboratories.
2. Able to figure outthe problemsthey encounter in expermients and successfully solving them.
3. To work - in groups - effectively in laboratories and in doing scientific researches . Being responsible of their duties and their relationships.
4. Familiar with the chemical reactionsofvarious materialsunder electric field.

Module Content

(Theoretical)

Topic	Weeks	Teaching Hours
Definitions of potentialdifference , decomposition and polarity effort, the types of overvoltage and how it is measured and the necessary precautions	2	6
Cathodic and Anodic processes (Tafel Equation)	2	6
The overeffort of the escalation ofhydrogen gas-the escalation ofoxygen gas	2	6
Concentration Polarization	1	3
Cathodicmetaldepositionanddepositionmethods-factors affecting thenature of thesediments-examples ofdeposition- Anodicprocesses:inactivityand its	4	12

theories		
Corrosion phenomena : Its types , the factors that may affect it and how it can be avoided	3	9

(Practical)

Topic	Week	Hours
- Using the chemical methods to measure the corrosion rateof theiron in theacid environment. - Utilizing the chemical methods to measure the corrosion rate of the Aluminum in the basic medium. - The effect of the addition of organic materials on the rate of corrosion of (Iron in the Acid medium – Aluminum in the basic medium) , and the calculation of the percentageof inhibitionin each case. - The cathodicdeposition of Cooper using Coppersulfate , and the caculation of the percentage of precipitation . - The anodic deposition of Lead. - Identifying the decomposition effort of strong Acids , Bases and Salts. - The anodic polarization of Iron in Acids media. - The anodic polarization of Aluminum in Basis media. - The anodic polarization of Aluminum in Acids media.		

Recommended textbooks and supplementary references

Recommended textbook	Electro-Non reversible Chemistry
Author’s name	Alkhaldi, Mashaael
Publishing Year	2004
Author’s Name	Hijazi , Abdullah
Publisher	Alrushed Library for Publishing

Model (5)

Course Description Summary

Module Title	Introduction to Statistics
Module Code	Stat101
Title and code of a perquisite module	Non
Module Level	second
Credit hours	3 hours

Module Description

This module includes the study of descriptive statistics and the explanation of the most important methods of distribution and representation of figures in society and the coefficient correlation between them and the probability of occurrence of each of them, as well as identifying the distribution of probabilities and the types of variables that may influence them .

Module Aims

1. The ability for analyzing data and interpretation of phenomena under investigation to examine them statisically .
2. Moving from the description stage to a stage in which students are able to make decisions.
3. Interpreting results logically.

Learning Outcomes

At the end of the semester , students will be :

1. Able to analyze data and interpret phenomena under investigation to examine them statistically .

2. Moving from the description stage to a stage in which students are able to make decisions.

3. Interpreting results logically.

Module Content

Topic	Weeks	Teaching Hours
Part 1 : Descriptive statistics : Classification of datain a distributedfrequency tableand presenting the most	1	3

important waysto represent itgraphically		
Measures of central tendency(mean - medianandmode) for a simple andclassifieddata	1	3
Measures of dispersion(rangeandstandard deviation) for a simple and classifieddata.	1	3
Correlationbetween two variables(Pearson andSpearmancoefficients for rankingcorrelation .	1	3
Part 2 :Probability andProbability Distributions : The sample spaceandthe traditional definitionof thelikelihood ofan incident- The probabilityaxiomsandsomeprobabilisticrules	2	6
Conditional probabilityandscalar product– The independence ofaccidents	1	3
Discrete random variableandits probabilitydistribution	1	3
Mathematical expectation-the distribution center and its variation .	1	3
Recurringcurve for acontinuous random variable(density function) -cumulativedistribution function	1	3
Binomialdistribution rule – its medium and variation	1	3
The natural curve and the areas under density curve – Normal and standard distribution table – Central limit theory - Approximation ofbinomialdistributionby using naturaldistribution.	2	6
Using distribution table – T , Kai square – F	1	3

Recommended textbooks and supplementary references

Recommended textbook	Introduction to statistics
Author’s name	Abu subhi ,MuhammedSaleh Oudh , Adnan
Publishing Year	1983
Publisher	Alyarmouk Library
Reference 1	The basic concepts ofprobabilityPart 1and 2
Author’s name	Tarabeeh , Ahmed MuhammedKamil
Publishing Year	2004
Publisher	Alrushed Library

Model (5)

Course Description Summary

Module Title	Nuclear and Radiation Chemistry
Module Code	CHEM424
Title and code of a perquisite module	Electro-Reversible Chemistry 2(CHEM 323)
Module Level	The eighth
Credit hours	3 Theoretical hours

Module Aims

1. Acquaint students withthe Nuclear and Radiochemistry sciences.
2. Acquaint students with the nature of the module in real life , its uses and its positive and negative influence on creatures.
3. Familarizing students with the nuclear interactions , radiation measuring instruments and radioactive resources.

Learning Outcomes

At the end of the semester , students will be :

1. To work - in groups - effectively in doing scientific researches . Being responsible of their duties and their relationships.
2. Able to figure outthe problemsthey encounter and solving them successfully.
3. Having the knowledge about nuclearinteractions, radiationmeasuring instrumentsand radioactivesources.
4. To describe the nature of Nuclear and Radiochemistry scciences.
5. To explain the nature of the module , its correlation with the real life , its uses and its positive and negative effect on creatures.

Module Content

Topic	Weeks	Teaching Hours
Radioactivity : its definition and detection - Radioactive decayofAlpha, Beta andGamma–Decay law – The relationship betweenradioactivityand mass	4	12
Naturalradioactive elementsandindustrialradioactiveelements- Isotopicdefinition, production and	2	6

somedefinitionsforatom		
Nuclear fission, its definitionanddiscovery– Bohr'stheoryof nuclear fission.	1	3
Nuclear fusion: (Proton-proton) cycle -carbon cycle	1	3
Nuclearaccelerators: A simplified ideaabout the use ofacceleratorsand reactorsin the production ofisotopes - Neutron sources-the interaction ofradiationwithmaterials -radioactive reagents-radiationmeasuring devices	6	18

Recommended textbooks and supplementary references

Recommended textbook	Nuclear Chemistry
Author's name	Jon Wily and Son Inc. ,
Publishing Year	1981
Publisher	A.J.Swallow Long man
Reference 1	Nuclear and Radio Chemistry
Author's name	Alatas ,Ameerah Abu Almajd ,AbdulaleemSuliman
Publishing Year	2005
Publisher	Alrushed Library

Model (5)

Course Description Summary

Module Title	Natural Products Chemistry
Module Code	CHEM421
Title and code of a perquisite module	Heterocyclic Compounds chemistry (CHEM 221)
Module Level	The eighth
Credit hours	3 Theoretical hours

Module description

This module includes the definition of the natural products . In addition , it embraces the presentation of compoundsderived fromsecondarymetabolic processes , their classification and the methods that are utilised to identify their structures (Chemical and spectroscopy methods)

Module Aims

1. Familarize students with the natural products .
2. Presenting the natural compounds that are derived fromsecondarymetabolic processes and the methods that are utilised to identify their structures (Chemical and spectroscopy methods).

Learning Outcomes

At the end of the semester , students will be :

1. To identify the natural compounds that are derived fromsecondarymetabolic processes , their classification and the methods that are utilised to identify their structures (Chemical and spectroscopy methods).
2. To identify the classification of turbines according to natural Isoprene laws – The simple turbines chemistry , particularly , monounsaturated turbines C10 , cisco turbine C15 and bio-synthesis turbines .
3. Having the knowledge aboutSteroidsandCholesterolandbile AcidsandHormonesandbio-synthesis of Cholesterol.

4. To identify the methods ofextractingalkaloidsfrom plants such as Ephedrine, Nicotineandturbinesandshowing their bio-synthesis.
5. Appling spectra tosomenatural products.
6. To concludesthe synthesis ofsome bio products.
7. Having interpersonal skills and being responsible . Solving problems in groups . Doing a collective research.
8. Having communication skills, proficientin information technology, and havingnumericalskills: 1-Calculatingratio ofoutputs.
   2.Using Chemicalwebsites.

Module Content

(Theoritical)

Topic	Weeks	Teaching Hours
Identifying the natural compounds that are derived fromsecondarymetabolic processes , their classification and the methods that are utilised to identify their structures (Chemical and spectroscopy methods	4	8
Identifyingthe classification of turbines according to natural Isoprene laws – The simple turbines chemistry , particularly , monounsaturated turbines C10 , cisco turbine C15 and bio-synthesis turbines .	4	8
Steroids– Brief description of Cholesterolandbile AcidsandHormonesandbio-synthesis of Cholesterol.	1	3
The methods ofextractingalkaloidsfrom plants such as Ephedrine, Nicotineandturbinesandshowing their bio-synthesis.	4	12
Drawing natural productsand then diagnosing themby normal and spectroscopic methods.	13	26

(Practical)

Recommended textbooks and supplementary references

Recommended textbook	Natural Products
Author's name	Alhazmi , Hassan Muhammed
Publishing Year	2001
Publisher	King Saud University – Library Affairs Deanship – Dar Alkureeji for Publishing and distribution
Reference 1	Nuclear and Radio Chemistry
Author's name	Alatas ,Ameerah Abu Almajd ,AbdulaleemSuliman
Publishing Year	2005
Publisher	Alrushed Library

Model (5)

Course Description Summary

Module Title	Dyes chemistry
Module Code	CHEM413
Title and code of a perquisite module	Organic Chemistry II(CHEM 211)
Module Level	The seventh
Credit hours	4

Module Description

The module includes the following topics :

- Colors and the photoelectric effect theory.
- Types of dyes (Azo, Nitrozo, Nitro, Triarylmethane ,Zanthan,Andigwo,and active dyes).
- Types of dyeing processes.
- Kinetics and Thermodynamics of the dyeing process.
- Types of fibers (Cotton, Wool, Cellulose, synthetic fibers, Ryon, Silk).
- Fiber manufacturing, purification and evacuation and bleach.
- Cellulosic fibers (composition, properties and methods of identification).
- Kinds of forces that bind dyes with fiber.
- The Practical Part : Preparation of some organic dyes such as Azo dyes and Phthalene, and doing a dye process on cotton fiber and silk.

Module Aims

1. To provide students with a general review of organic dyes.
2. Make students able to prepare organic dyes such as Azo or Phethalene dyes.
3. Familarize students with the Physical properties of organic dyes.

Learning Outcomes

At the end of the semester , students will be able :

1. To –identify the types of dyes (Azo, Nitro , Nitrozo, triarayl Methane, Zanthan, Indigwo and active dyes).

2. To Prepare some organic dyes such as Azo and Phethalene dyes.
3. To identify the pysical properities of organic dyes and the kinds of forces that bind the dye with fiber.
4. To be able to distinguish between the different types of fiber.
5. To be able to write chemical formulas of dyes under investigation.
6. Having interpersonal skills and being responsible . Solving problems in groups . Doing a collective research.
7. Having communication skills, proficient in information technology, and havingnumericalskills: 1-Calculating ratio ofoutputs.
   2.Using Chemicalwebsites.

Module Content

Topic	Weeks	Teaching Hours
Colors and the photoelectric effect theory.	1	3
Types of dyes (Azo, Nitrozo, Nitro, Triarylmethane ,Zanthan, Andigwo,and active dyes).	3	9
Types of dyeing processes	1	3
Kinetics and Thermodynamics of the dyeing process. .	2	6
Types of fibers (Cotton, Wool, Cellulose, synthetic fibers, Ryon, Silk).	1	3
Fiber manufacturing, purification and evacuation and bleach.	2.5	10.5
Cellulosic fibers (composition, properties and methods of identification).	2.5	10.5
Kinds of forces that bind dyes with fiber.	1	3
Practical part	13	26
Preparation of Phethalene dyes	2	4

Preparation of Azo dyes	3	6
Preparation of Nitrozo dyes	2	4
Preparation of Zanathan dyes	2	4
Doing a dyeing process on cotton fiber.	2	4
Doing a dyeing process on silk	2	4

Recommended textbooks and supplementary references

Recommended textbook	Industrial Dies:Chemistry Properties ,Applications
Author's name	KallusHonger
Publishing Year	2003
Publisher	VCH,VerlagGmbh and KcoAWeinleim
Reference 1	Organic Chemistry
Author's name	R.T.Morrison&R.N.Boyed
Publishing Year	1987
Publisher	Allen &Bacon Inc.U.SA.

Sixth : The requirments of the program implementation

١. Human readiness

What is the numberof faculty membersthat is required at the beginning of the program?

Major	Specialization	Academic Ranking	Required Number	Available number in other in department the college
Chemistry	Organic	Assistant professor	٣	None
Chemistry	Inorganic	Assistant professor	٢	
Chemis	Biochemistry	Assistant	٢	

		professor		try
What is the required number of lectures at the beginning of the program				
Available number in other department in the college	Required Number	Specialization		Major
None	٢	Pysical Chemistry		Chmistry
	٢	Analytical Chemistry		Chmistry
	١	Parasites-immunity		Biology
What is the required number of teaching assistants at the beginning of the program				
Available number in other department in the college	Required Number	Specialization		Major
None	٥	Teaching assistant are often not specialized yet.		Chemistry
؟What is the required number of technician at the beginning of the program				
Available	Required	Specialization		Major

number in other department in the college	Number		
Unavailable	٧	Laboratory assistant + Laboratory technician	Chemistry

Materials Capabilities.٢

What is the number of the required classrooms at the beginning of the program

٣	Required Number	٦	Total Number

What is the number of the required laboratories and workshosps at the begnning of the programm

SR	Current cost	٣	Required Number	SR	Total cost	٦	Total Number

and teaching assistants What is the required number of offices for faculty members, lecturers

١	Current required	_- -rooms ٣	Total

		number	offices ١٥				Number

What is the number of offices for management, services , meetings and conferences-

١	meetings	١	Conferences	١	Student affairs	٥	Managment offices

Please specifythe offices ofadministrationand services required: (Head of Department, Associate, secretary, library, etc.....)

The members officesshould be separated fromadministratorsoffices.

1Head of0.1secretary0.1library

Seventh:toolsandsources ofeducation andlearning

Learning and teaching tools

What are the necessary learning tools that are required to implement the program?

(Please select a tool, and describe it)

Traditional tools	
Mobile board	-
Markers	-
Erasers	-
Posters as a method for clarification	-
Laboratories	-
Audio tools	
Recordings	-

Recorded lectures	–
Visual tools	
Television network	–
Photos	–
Slide shows	–
Paintings	–
Holographics and films	–
Data show	–
Electronic tools and programs	
Computers	–
Projectors	–
Smart boards	–
Crocodile program for teaching Chemistry	–
Power point	–
.Virtual labs	–
Compact discs, digital videodiscs, Internet, e-publications, e-books,Electronic tests bank	–
Learning and teaching resources.٢	
Magazines and periodicals	

.Journal ofSaudi Chemical Society	–
ArabChemicalJournal	–
Arab Journal ofChemistry	–
Chemistry Education Journal	–
Specializedwebsites	
http://www.organic–chemistry.org/ **http://www.acdlabs.com/iupac/nomenclature/** **.http://www.chem1.com/acad/webtext/gas/gas_3.htm**	–
chemix, **chemsketch**, **chemdraw**	–
http://en.wikipedia.org/wiki/Organic_chemistry **http://www.organic–chemistry.org/** **ht tp://www.Spriger.com** **ht tp://www.chemholper.com**	–
Science–direct	–
Othereducational resources(courses, workshops, and training)	
Securityand safetycourses	–
A course in the disposal oflaboratorywastein a safe manner	–
Coursesoffered byprogram members aboutthe use of computerapplications inchemistry, Hormonesand Enzymes	–

The availability of learning resources	
% ٣٥	Whatpercentage oftextbooksthat are currently availablein the libraryfor the modulesthatwill be taughtin the program?
None	Whatpercentage ofmagazines, and periodicalsthat are currently availableand has arelationship withthe program?
%١٠ weak	Whatpercentage ofscientific supportingsources, which are currently availablein the library, andwill be usedto teachcoursesin the program?

v

One book is allocated as a main book for each course in the plan, and two supporting books, fill the table below

Availabl e copies	Require d copies	**Author**	**Publis her**	**ISBN**	**Book Title**	**Course**
-	٣٠	Alzamil , Ibrahim Zamil	Dar Alkreeji for publishi ng and distribut ion	-٦٨١-٩٩٦٠ ٢-٢٦	Analytical Chemistry (automatic analysis)	Analytic al Chemistr y
-	٣٠	Islam, Ahmed Midhat	Dar Almaari f	-٠٢-٩٧٧-٩٧٨ ٥-٧٢٠١	Principles ofpracticalch emistry	
-	٣٠	Hilwah, Omar Jabar	Dar Kinooz Almaarf	٢٠٠٨-٤-١٢١٧	Creativitykey forAnalytical Chemistry	

			ah Alaalmeeh			
-	٣٠	Hilwah, Omar Jabar	Dar Kinooz Almaarfah Alaalmeeh	١٦٣٤٣٧	Creativitykey forChemistry	General Chemistry
-	٣٠	Hilwah, Omar Jabar	Dar Kinooz Almaarfah Alaalmeeh	٥٤١٥٤١	Creativitykey forChemistry	
-	٣٠	Jarar, Aadel Ahmed	Alfalah Library	٦٠٠٠٦٤٦	General Chemistry	
-	٣٠	Abdulaziz , Ahmed	King Fahad National Library	٩٧٨٦٠٣٥٠٧٠٢٤٩	General Chemistry	
٢	٣٠	Alaafalig , Aljazi	Alobikan	-٥٤-٩٩٦٠٦-٢٤١	Comprehensivein Practical organic	Organic Chemistry

					chemistry	y
-	٣٠	Alhazmi , Hasan	Dar Alkreeji	-٨٥٧-٩٩٦٠ ٥-١١	Organic Chemistry	
٢	٣٠	Alhazmi , Hasan	Dar Alkreeji	-٨٥٧-٩٦٦٠ ١-٦١	Natural Products	
-	٣٠	Hasan ، Alhazmi	King Saud Univers ity	-٨٥٧-٩٦٦٠ ٧٠-٦٩	Heterocyclic Compounds	
-	٣٠	Alhidan , Hamad Abdullah	King Saud Univers ity	٤٩٨-٣٧-٩٩٦٠	Heterocyclic and bio Compounds	
٢	٣٠	Althyab , Salem Sleem	King Saud Univers ity	٢٧٧-٢٧-٩٦٦٠	Petroleuman dpetrochemi calindustries	
٢	٣٠	Althyab , Salem Sleem& Alhazmi , Hasan	Dar Alkreeji	-٦٥٩-٩٩٦٠ ٩٠٧	The basic principlesint he spectra oforganic compounds	
-	٣٠	Ezmarly, Saleh Shawaly , Abdullah&	Publish es of the	-٩٩٥٩-٩٧٨ ٠-٠٦٢-٥٥	Entrancetot he dynamics ofthedynami cs oforganic	

			universi ty of th ٦the of Octobe r		reactions	
١	٣٠	Alkhaldy , Mishaeel	Alrushe d Library	-٤٤-٩٩٦٠ ٩-٥١١	Electro Nonrevers ible Chemsitry	-Electro reversibl e Chemistr y
١	٣٠	Alkweetar, Suliman	Dar Alkreeji	-٨٧٩-٩٩٦٠ ٨-٣٤	Thermod ynamic Chemistry	Thermo dynamic Chemistr y
---	٣٠	Abu almajad, Abdulaaleem	Dar Alfikar	٥٦٤٢٣٢٣	Kinetics Chemistry and Thermody namics	
---	٣٠	Abu almajad, Abdulaaleem	Dar Alnasha r for Univers	-٣١٦-١٣٥-٨ ٩٧٧	Fundamenta lsof Physical Chemistry	

			ities			
١	٣٠	Fareed ، Aataia Ibraheem, Dalia&	Alrushed Library	-٠١-٩٩٦٠ ٧-٥٢٢	Biochemsitry	الكيمياء الحيوية
---	٢٥	Abdulrahman, Suheer	Almutanbi Library	-٦٠٣-٩٧٨ ٨-٠٥-٨٠٢٤	Basicsin Biochemistry	
---	٢٥	Alameery , Jeehan	Almutanbi Library	------	Biochemistry	
---	٢٥	Abdulfatah , Husain	King Fahad National Library	٩٩٦٠٠٥٧٧٦٩	The foundations ofmajor groups chemistry	الكيمياء الغير عضوية
---	٢٥	Manshi , Mahmoud	Alobikan Library	٩٩٦٠-٢٠	Major Groups Chemistry	
---	٣٠	Alsaleh, Muhammed Khalifah	King Saud University	٧-٠٣-٠١٦٥٠٢	The transition elements Chemistry	
---	٣٠	Algasem, Muhammed	King	٩٩٩٠٦١٠٣٣٩	The basic	

		Abu Algasem , Hasan&	Saud Univers ity		transition elements and the consistenc y Chemistry	

Eighth: Thefuture planof the program:(here meantthe strategic planfor thedepartmentduring the five yearssince the start ofthe program)	
What is the mechanism by which the program will be developed if there is a necessity to	
Comparaing plans to local and global universities plans	_
The establishment ofa communitypartnership with thepublicand the private sectors, in order to progress and improve plans	_
Looking at similar local, regional and global experiences	_
The active participation ofthe concernedfaculty members, students, and alumni	_
Cultural and academic cooperationwithvarious universities, scientific institutionslocallyregionally, and globally, in order to achievea high quality ofthe planusingvisits.	_
Coordinationwith the relevant authoritiesto organizeworkshops and training courses	_
Studyingthe needsof the labor market	_

reviewingthe self-assessmentof the program,and consideringsuggestionstoimproveweaknesses	_
What is the training plan that will be utilized and implemented for students	
Preparingworkshopsfor studentsto talk about thevision ofthe program,its missionand objectivesfor the students	–
Preparing workshops arranged by specialists in designing study plans with the participation of faculty members	–
Preparingworkshops toillustrate theimportance of the participationof studentsin the program	–
Preparingworkshops aboutsecurity , safetyandcomputer applicationsinchemistry.	–
Preparation of trainingcoursesin English	–
What are the steps that will be taken to ensure the ideal quality of education in the department	
Academic Advising	
Provide students withthe appropriatebackground information aboutthe program,its facilities, services, andfacilities that are providedso as to offera learning environmentthat helpsstudentsto learn ,acquire knowledge, face difficulties, solve problems,and todirect them tothose whocan contribute in solving	–
Acquainting students with the organization and the regulations that are utilized in organizing the educational process	–
Helping studentsin accomplishingtheir study plans	–
Paying attention to high and low achieving students	–
Helpingstudentsto discovertheir abilities ,determinetheir goalsand to taketheir decisions.	–
.The contribution in guding new entrants and expected graduating students	–

PreparingAcademic GuidanceManual,and distributing it tonew studentsat the beginning ofthe .semester	–
	–
Defining time for academic advisory,unloading students and faculty members and choosing a suitable place for a private meeting	–
askingeveryfaculty memberto submita report abouthis efforts inAcademic Advisoryacademic year	–
makingquestionnairesto determinethe effectiveness of theAcademic Advisory	–
Exams	
Application of qualitystandardsin tests. The formulation oftest questionscorrectlywiththe diversity ofquestions_objective-essay	–
easy to difficult ones Moving gradually in making questions from	–
The formation of test committees (observation&control	–
Formingan internal committee in the departmentto reviewthe marking ofsampletestanswersheetsfor each courseby not less than5%.	–
externally by specialists from different Marking sample of test answer sheets universities	–
Organizing a guiding meetingfor studentsabout testsand its instructionsand how to prepare for themand keepingthe names of students who attendedtothis meeting	–
Organizing a guiding meetingfor faculty membersabout testsand its instructionsand how to prepare for themand keepingthe names of students who attendedtothis meeting	–
Learning process	
The use of modernelectronic meansof teaching	–
The use of modern variedreferences	–

improving plans which is based on students opinions Making an	-
Graduationprojects:	
not applied	-
Training	
Defining an academic and educational advisors for each student	-
Placing field training in a full semester	-
:Other things	
None	

Ninth:quality requirements:	
No ☐ Partly ☐ Yes☑ No☐Partly☐Yes☑	1.Study Plan(the academic program): - -Does the programachieveeducational outcomesthat have been - setdepending on thequality requirements?
No☐Partly☐Yes☑	ac - Description of modules : - Is the description of courses in accordance with the standards of quality comparing it

No☐Partly☐Yes☑ No☐Partly☐Yes☑	with its counterparts in other universities? - Are courses have been chose according to the rates that achieve education outcomes for the program ? - Are the outcomes of the modules have been decided according to specified criteria? -
No☐Partly☐Yes☑ No☐partly☐Yes☑	3. The teaching staff: - Are the staff specializations have been chosen so as to to achieve the objectives of the course? - Do you think that the necessary specializations are available for your department? -
ac In the case of facing difficulty in providing qualified teaching staff , what is your plan to find alternatives?	
Usingmembers of theteachingstaff fromthe same university.	١
Usingvisitingprofessors.	٢
4.Arethe learning outcomesof the program in accordance withwith the NationalFramework of Qulaifications and Comparison ?	

Consistency	The proposed program	Bookmark	ac National Framework of Qulaifications and Comparison	comparison aspect
consistent	The programmodulesinclude manyconcepts, principlesand theoriesthat students recognizeduring their studies. In addition , they	Identifying thebases,theoriesandchemical and educationalconcepts Improving students'creative thinking skillsthrough	Knowledge: the ability to retrieve information , understanding it and presenting it which includes: - Knowledge of certain facts - Knowledge of the	Knowledge Facts Concepts Theories Procedures

	will be familarized withtheoriesfromother sciencesthat are related toChemistrysuch asMathematics, Physics,and Sciencethrough thestudyof some of thesesciencescourses. -The students of the department will be acquainted withsome of the recentdevelopmentsin Chemistryand its branchessuch as: Organicchemistry,Inorganic chemistry,Analytical chemistry,Physicalchemistry andPolymer chemistry. These coursesincluderesearch which introducessolutionsforsome issuesrelated to thosebranches. -Students are familiar withthe regulations andand the technicalaspects oftheir future profession, which gives them theability toimproveuponthe occurrenceof newvariables. -Students havesufficient information aboutother professional fields that are related to Chemistry -Students have knolwedge aboutcertain	doing chemical researches Being ableto solve the problems	concepts , bases and specific theories - Knowledge of certain procedures.	

	proceduressuch assolvingmany issuesthat face them in their modules , for example, solving equations in: ElectricalInverse,Quantum chemistryand differentialrates.			
Consistent	-The application ofthe conceptualunderstandingof the concepts , proinciples andtheories . -We find that the program modulescontain a number ofpracticalissues -The ability to applythe methodsinvolvedincritical thinkingand creativeproblem solving -Lesson plansof the program modulesincludea lotof topicsthat canprovokecreative thinkingamong students -Providing informationand concepts -The application ofethical standardsand academicteachingand researching. -Creating a safeand aneffective workingenvironmentin laboratoriesand in thefield trainingplaces -Studyingtopics andproblemsin the fieldof studyusingvariety ofsourcesand	Critical Thinking Skills Conclusion skills The application of theories in problem solving Innovation Skills Data interpretation skills	-The application ofthe conceptualunderstandingof the concepts, principles andtheories. -The application of methodsinvolvedincritical thinkingcreativesolutionto the problemswhether it'sat the request ofothers, orwhen faced withnew and unexpected situations. Studyingsubjects andproblems in astudyareausingvariety ofsourcesand drawingvalid conclusions.	Cognitive skills

	drawingvalid conclusions -The program embraces alot ofareas that canenrich studentsabout thepracticalortheoretical aspects -The program aims to encourage students to searche for a solution for complex problemsusing ITand to take advantage of theknowledge andtheories that have been studied.. -The ability tofind innovativesolutions to problems - Testinghypothesesby choosinga structuredmodel,conducting experiments ,recordingevidenceand interpreting themcorrectly.			
Consistent	ac Taking responsibility for their self-learning, and continuing personal and professional development - - The program includes a lot situations that students will have to depend on themselves and to find solutions under the supervision of a teaching staff member. - Working in groups effectively and exercising leadership when needed. - This can be done during the study process or when solving some issues which	- Taking individual responsibility - Leading Groups - Teamwork - Moral responsibility - To maintain the facilities tools - Being initiative at work	Taking responsibility for theirself-learning, and continuingpersonal and professional development Workingeffectivelyin a groupand exercisingleadership when needed. Acting responsiblyinpersonaland professional relationships Behaving ethicallyand having a commitment	The relationship skill between people and responsibilty

	require innovative responses. - Students should be initiative in identifying critical issues individually or within a group, , bearing the responsibility for the development of their own learning . - Behaving ethically and having a commitment to high ethical values personal scope , social - Studying can develop students' spirits of saving expensive tools and devices . In addition , to having high moral character . - Students will have values and moral judgments when they exercise their professions.		topersonal and socialmoral values	
Consistent	1.Effective oral and written communication as the program modules include different aspects that may contribute to enhancing students' communication skills . These aspects involve the following : -The use ofsome form ofeffectivepresentation andvarious tools ofinformationtechnology . – Students can commnicate with faculty members by writing , either , during their field training or using latest technologies such as webistes. – The use of	-The effective use ofinformation technologybystudents and faculty members. - Taking advantage ofstatistical and mathematical informationindeveloping themselves	ac Oral and written effective communication . The use of communications and information technologies. The use of mathematical and statistical basic methods	Communication skills

	communication and information technologies . Students' abilities in using these technologies can be enhanced by asking students to do homeworks , refering to electronic resources or by the use of computer learning softwares. – The use of basic statistical and mathemetical methods as the modules include various equations in which students will be engaged in solving them using mathemtatics and statistics.			
Consistent	preparing Highly laboratories to allow students to make experiments effectively		Includingphysicaldexterity, a fifth area, which applies toonlysome of the programs.These skillsare consideredof highimportancein certainfields of study,for example, the psychological motor skills arehighlyrequiredfor surgeons,artists andmusicians.	Mentalandmotor skills

Learning Outcomes

A	Knowledge: Facts,conceptsand procedures fortheories
B	Cognitive skills Applying skillswhenneeded Creative thinkingfor solving problems
C	Interpersonal skills and responsibility
C–1	Responsibility for own learning
C–2	Collectiveparticipation and leadership
C–3	Reliableresponsesin thepersonal and professionalsituations
C–4	Ethical standardsand good manners.
D	Communication skillsand the use ofnumericalinformationtechnology
D–1	Oral and Written Communications
D–2	Use of IT
D–3	BASIC MATHEMATICS AND statistics
E	Psychomotor skills

Course Title	Course Code	A	B	C–1	C–2	C–3	C–4	D–1	D–2	D–3	E

General Chmeistry ١	CHEM١١١	x	x	x	x	Y	x	X	x	x	X
Organic Chemistry ١	CHEM١٢١	x	x	x	x	Y	Y	X	Y	Y	X
Inorganic Chemistry ١	CHEM١٢٢	x	x	x	Y	Y	x	X	x	x	X
Descriptive Analytical Chemistry	CHEM٢٢٤	x	x	x	Y	Y	x	X	x	x	X
Quantitative Analytical Chemistry	CHEM٣١٥	x	x	x	Y	Y	x	X	x	x	Y
Heterocyclic Compounds chemistry	CHEM٢٢١	x	X	Y	Y	Y	Y	X	Y	Y	Y
Physical Organic Chemistry	CHEM٢٢٣	x	X	Y	Y	X	x	X	x	x	Y
Electro-Reversible Chemistry 1	CHEM٢٢٥	x	X	x	x	Y	x	X	x	x	X
Organic Chemistry II	CHEM٢١١	x	X	x	x	X	x	X	x	x	X
Quantum Chemistry (1)	CHEM٢٢٢	x	X	x	Y	X	x	X	x	x	Y
Thermodynamic Chemistry	CHEM٣١٢	x	X	x	Y	Y	x	X	x	x	X
Quantum Chemistry (2)	CHEM٣١١	X	X	x	Y	Y	x	x	x	x	Y
Electro-Reversible Chemistry 2	CHEM٣٢٣	X	X	x	Y	X	x	X	x	x	Y
Inorganic Chemistry(Transition Elements)	CHEM٣٢٢	X	X	x	Y	X	x	X	x	x	Y
Coordination Chemistry	CHEM٣٢٤	X	X	x	Y	X	x	X	x	x	Y
Dyes Chemistry	CHEM٤١٣	X	X	x	x	Y	x	X	Y	Y	X
Instrumental Analysis Chemistry	CHEM٤١١	X	X	x	x	Y	x	X	x	x	X
Nuclear and Radiation Chemistry	CHEM٤٢٤	X	X	x	x	Y	x	X	x	x	Y

Natural Products Chemistry	٤٢١CHEM	X	X	x	x	Y	x	X	Y	Y	X
Organic Chemistry (Organic Compounds Spectra)	٤٢٣CHEM	X	x	x	x	Y	x	X	Y	Y	X
Chemistry of Organic Reactions Mechanisms	٤٢٢CHEM	X	x	Y	Y	Y	Y	X	Y	Y	Y
Organic Chemistry (Polymers and Patrol)	٣١٤CHEM	X	x	x	x	Y	x	X	Y	Y	X
Non Reversible Electricity Chemistry	٤١١CHEM	X	x	x	Y	Y	x	X	x	x	X
-Physical Chemistry Phase Rule	٢١٢CHEM	X	x	x	Y	Y	x	X	x	x	X
Kinetic Chemistry	٤١٢CHEM	X	x	x	Y	Y	x	x	x	x	X
Biochemistry 1	٣٢١CHEM	X	x	x	Y	Y	x	X	x	Y	X
Biochemistry 2	٤١٤CHEM	X	x	x	Y	Y	x	X	x	Y	X
Physical Chemistry (Surfaces, Colloid s & Catalysis)	٣١٦CHEM	X	x	x	Y	Y	x	X	x	x	X

Student Affairs.٦	
- Whatproceduresthat will befollowed in theevaluation ofstudents?	
Distribution of Marks	
60% (final exam) – 20 (practical) – 40 (theoritical)	-

40% Midterm	–
Proceduresthat will be usedfor examiningachievement ofcriteria:	
Opinion polls.	–
Discussions thattake placewithfaculty, staff, orstudentsenrolled in the program.	–
Through reports that are written by the program administrators which includes their investigation of following the guides and evidences in quality assessment	–
Making comparisons with standards of other institutions .	–
Assessment ofexamination paperthrougha tripartite committeeof thedepartmentusingcourse specification,examining the modelanswerand its compliance withquality standards. Field visitsto schools.	–
- Managementand support ofstudents:	
What procedures will be followed to enhance Academic Advisory?	v
Meeting new students , distributing them to academic advisors in order to guide them during their study and introduce and explain regulations to them.	–
Communicatingelectronicallywith thethe academic advisorto ensure continuity ofcontact.	–
Making electronic questionnaires	–
Trainingcourses for newmembers inAcademic Advisory.	–
Preparing students'file, discoveringand supportinglow levelstudentsand excellent students.	–

Awarenessof the importance ofAcademic Advisoryand the importance of communicationwith thethe academic advisor bythe publication ofbrochures andleaflets.	–
What are the procedures for students to make complaints ?and what is the followed mechanism?	
The college board has the authority to exclude deprivation od a student ; allowing him to enter a test , in case , he provides an acceptable and persuasive excuse to the board. University council often defines attendance percentage ,to excuse students from deprivation , to be not less than 50% of attending lectures and tutorials.	١
If a student isunable to attendthe final testin any module due to a compulsive excuse , the college board is allowed to accept his excuse in cases of extreme necessity. An alternative test , to evaluate the student , would take place within a period notexceedingthe end of thenext semester.	٢
A student can apologize for not continuing to study a semester without considering him failed , if he provides an acceptable excuse to the university council during a period of time determined by regulations that are approved by the university council. The student will be marked by a (W) , and the semester will be calculated of the the duration needed to finish the graduation requirements.	٣
A student may apply for postponement of his study , if he provides an acceptable excuse to the university council . The postponement period can't be longer than two consecutive semesters or maximuly three non-consecutive semesters throughtout the period of his study in the university. If postponement is longer , his registration will be folded . However, the university council is authorized to excuse him in cases of exterme necessity . The postponement duration will not be calculated of the time neededto finish thegraduation requirements.	**4**
A student will be dismissed from the university if he gets three consecutive warnings , at the most , as his GPA will be lower than the specified rate for graduation according to article number 19. The university council , based on the college board recommendation , can give a fourth opportunity for those who can raise their cumulative GPAs when studying their available modules.	**5**
A Student will be dismissedfrom the universityif he doesnnot finishgraduation requirementswithin a maximum ofhalf ofthe perioddetermined for graduation added to the duration of the program. The university council has the authority to give an exceptional opportunity for a student to finish the	**6**

graduation requirements in a maximum period of not more than twice the primary time determined for graduation	
A student is allowed to transfer to another department once during his university study. However , the university council can exclude him but only once.	**7**
It is not allowed to re-enroll a student more than once. However, the rector can exclude him in case of necessity and based on a recommendation of the students' affairs committee .	**8**
If a student registration is folded for four or more semesters or two years for the colleges that apply the academic year system , the student can apply to the university as a new student without looking at his previous scripts . However, he should meet the admission requirements stated at that time , and and the committee of students' academic problems can exclude him according to the committee regulations.	**9**
The college board has the authority, on the recommendation of the department council , to define certain modules for a student in order to raise his GPA , if the student managed to pass the modules but his GPA is still low.	**10**
Students can't have more than two exams in one day . However, the university council has the aouthority to exclude certain students from this regulation.	**11**
The colleges boards , in cases of necessity , can give the approval of remarking of answer sheets within a period of time not exceeding the beginning of second semester exams.	**12**
A studentcan , after having an approval of thedean of the college , transfer from a speciality to another in the same college according to certain regulations set by the university council.	**13**

A students is allowed to withdraw from one or more modules in one semester according to the regulations set by the university council.	**14**
If a student is convicted in a criminal offense , the general committee is allowed to submit its recommendations of providing anything related to the offense to the competent authority such as documents and investigation papers. The general committee is , also , authorized to stop any disciplinary procedures against the convicted student until a final judgment is issued in his case.	**15**
It is not allowed to apply any disciplinary sanction on a student , if the general committee did not issue a decision after a year of committing the offense.	**16**
If a disciplinary decision is not dismissal fromthe university, the sanction must not be a cause to cancel a student's enrollment in the university.	**17**
The sanction should equal the degree of the offense , taking into consideration the criminal record and circumstances that surrounding the incident . The committee has the authority not to include the sentence within the period of violator study .	**18**
The sanction should not be applied on a violator until investigations are completed and his words , about charges , are written . If he does not appear at the date , on which he was informed , for investigation , he has no right to make any statement unless he provides an acceptable excuse , and the sanction will be applied in absentia.	**19**
After the approval of the vice president ofacademic affairs , the general committee decisions are considered effective , and who was chaeged has the right to appeal to the university rector within fifteen days of the charge notification. The university rector has the authority to reconsider the sentence or to define another penalty he belives is appropriate.	**20**
7.programevaluation, andimprovement Processes:	
Whatprocesses thatwill be usedto evaluateandimprove thestrategies usedto improve theeducationprocess?	

Using of data to make calculations which enable the department to make comparisons with different educational programs from the same institution or other similar institutions.	**1**
Performing statistical analyzes in order to find out the following matters: the extent of the completion of courses and programs, and the results of graduates recruitment, , the ratios of students to faculty members, and the qualifications of faculty members.	**2**
Takingthe advice ofindependent expertsabout theappropriateness ofteaching strategies, and the assessment methodsused indifferentareas oflearningthat are included in the"NationalQualifications Framework."	**3**
Whatprocesses thatwill be usedto assess the overallskills ofusinga followed strategy ?	
The formation of a committee , which its members are chosen from the evaluation and academic accreditation units in the college and in the departments , to review the strategies of each program.	**1**
Assigning a committee to review the general and the specific strategies of each program , and then providing a detailed assessment of each of them .	**2**
Holdinglectures and workshopsin which experts fromthe collegeand outside the collegeparticipate,in order toassess the overallskills.	**3**
Exploring the internal and external experts' views about the college performance using questionnaires or interviews.	**4**
The committee work should come up with results such as recommendations and notices including programs and courses descriptions which should be written in a specific formula where knowledge , skills and aimed values are defined for each program.	**5**
There should be a referential comparison for the college overall strategies . The strategies should be compared to the overall strategies of other educational institutions which are at the same level .	**6**

What arestrategiesthat will be usedin the programto get acomprehensive assessment of thequality of the programand improve itsoutcomes?	
Studentsand graduates	
Course EvaluationQuestionnaires	–
Graduates Questionnaires	–
Interviews with Chemistry school teachers	–
Hosting teachers and school managers who graduated from the department .	–
external evaluators	
Reviews of different universities for the description of the program modules.	–
Usingconsultantswith expertise inthe relevant areasto the program and listening to their points of view about the program evaluation .	–
Employees	
Employees Questionnaires	**1**
Questionnaires for the laboratories assistants	**2**
What arethe performance indicatorsthat will be usedforobserving , and typingthe annual report aboutthe quality ofthe program?	
Statistics	**1**
Studying the working environment of the program – Assessing the program .	**2**

Clarifyinginformation about thecourse-assessingthe quality of teaching	3
Program management andfulfillment - independent opinionabout thequality of the program	4
What are theprocedures thatwill befollowed in order toreview theassessments and the utilised plan to improve the program ?	
Performing quality assessment operations , on a regular basis , which are based on appropriate evidences and various suitable points (standards or levels) for each module.	1
Observing specific performance indicators and various sutiable points (standards or levels).	2
Attention is focusedon thelearning outcomesof students ineach course, which in turn contribute to theoverall goals of theprogram.	3

The program is approved on the department level and then the college level. Then, it is reviewed by the Deanship ofqualityand skills development using the below form in order to submit it to the university plans committee

Tenth:The program approval				
Notes	No	Yes	Article	.No
		√	An application has been submitted for a plan approval or for a plan modification	١
Foramation decision is attached		√	A committee is formed to examine the proposed study plan in the department . .	٢
Held in ١٤٣٥/٦/٨		√	A training workshopfor faculty membersabout the development ofplans and study programs has beenheld.	٣
The department council report is attached		√	The plan was approved in a formal meeting for the department council in	٤
The college report is		√	The plan was approved in a formal meeting for the college board in	٥

attached				
Done		√	TheNationalQualifications Frameworkis followed	٦
King Saud University Umm alquraa University Bahrain University		√	A set ofmodernacademic plansof Arab and global universities have veen explored (attaching a list)	٧
	√		Recruiter who are relevant to the program have been interviewed (Attaching a list)	٨
	√		Various global institutions which have similar specialization areas have been explored. (Attaching a list)	٩
	√		Studentswere polledaboutthe study planby using(questionnaires, workshops, meetings, email, etc....) (samples attached).	١٠
	√		Graduateswere polledaboutthe study planby using(questionnaires, workshops, meetings, email, etc....) (samples attached).	١١
Matrices are attached		√	Educational outcomes have been identified(skills, knowledge, attitudes) (to be determined at the university , college, and department levels)	١٢
In the eighth level The training field experience		√	The plancontainedafield trainingcourse(as possible).	١٣

report is attached				
The practical hours for the automatic analysis to four practical hours . (The plan is attached)		√	Thepractical sidehas been intensifed forsomecourses(as much as possible).	١٤
	√		Theplanincludeda programof cooperativetraining(as possible).	١٥
Done in the practical modules (The plan is (attached		√	Attention has been paid for improving and enhancing specialized skills .	١٦
The course description is attached in Arabic and English		√	The course decription has been included.	١٧
The modules descriptions are attached		√	The modules course descriptions have been .included	١٨
Arabic		√	The Modules teaching language has been .identified	١٩

Brief descrptions for all the modules are attached		√	The modules brief course descriptions have been included.	٢٠
The developed paln is attached		√	The requirements of applying the study plan form has been included.	٢١
the study plan is included ١٤٤		√	The minimum numberofcredit hours have been decided.	٢٢
Done and mentioned earlier The vision , message and goals are attached		√	vision,message,and goals have been identified.	٢٣
Professors from Umm alquraa university were consulted. Reports are attcahed .		√	The plan have been assessed by specialists.	٢٤

Bachelore in -Education Chemistry		√	The qualification title that a graduate gets has been defined.	٢٥
Mentioned earlier		√	The terms and conditions for attending the program have been defined.	٢٦
Mentioned Earlirer		√	Institutions and recruiters that may employ graduates have been defined.	٢٧
The matrix is attached		√	The programmatrix has been prepared.	٢٨
Prepared		√	A matrix which shows the consistency of the program with the NationalQualifications Framework has been prepared.	٢٩