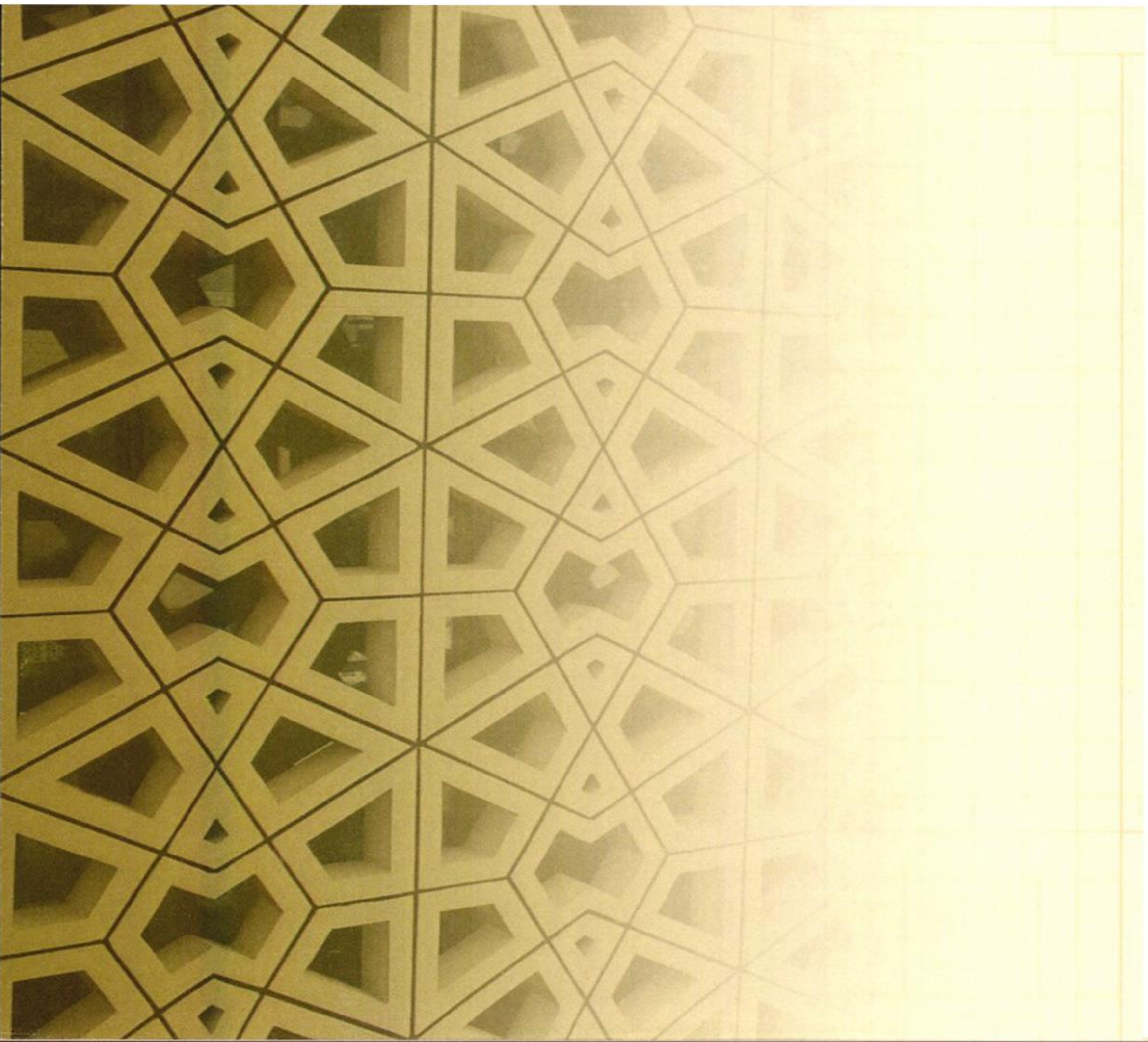
Module Handbook

(Courses Specifications)

Current Plan 1437

كلية العلوم التطبيقية
Faculty of Applied Sciences



قسم الكيمياء
Department of Chemistry

Umm Al-Qura University, 2018

VISION OF CHEMISTRY DEPARTMENT

To make up for shortfall in the job market and training in the field of chemistry to promote our country in the fields of education, scientific research and industry through providing high quality education in line with international standards and principles.

MISSION OF CHEMISTRY DEPARTMENT

To prepare a generation of qualified national scientists and researchers to meet the needs of the job market, and to effectively contribute in solving scientific and industrial problems facing the development plans in the Kingdom of Saudi Arabia.

OBJECTIVES OF CHEMISTRY DEPARTMENT

- Graduating competent and specialized national scientists required to serve the community and the development plans, programs, education and industry in the Kingdom.
- Conducting academic and applied scientific research.
- Contributing to the dissemination of scientific awareness through organizing scientific conferences and symposia.
- Providing technical services in the field of chemistry for the public and private sectors.

Department manual is available for students or other stakeholders and a copy of the information relating to this program also attached to the program specification. This information include required and elective courses, credit hour requirements and department/college and institution requirements, and details of courses to be taken in each year or semester.

CHEMISTRY STUDY PLAN

FIRST YEAR			
LEVEL 1			
Course No.	Course Name	Credits	
		Theo.	Pract.
4041011-4	Calculus	4	
40210101-4	General Chemistry 1	3	1
705101-4	English	4	
605101-2	Quran1	2	
601101-2	Islamic Culture 1	2	

LEVEL 2			
Course No.	Course Name	Credits	
		Theo.	Theo.
4011012-4	General Biology	3	1
4031012-4	General Physics	3	1
705102-4	English for Applied Science	4	-
501101-2	Arabic Language	2	-
102101-2	Prophetic Biography	2	-

SECOND YEAR

LEVEL 3

Course No	Course Name	Credits	
		Theo.	Theo.
40220340-2	General Chemistry 2	2	-
40220330-3	Chemistry of Aliphatic Compounds	2	1
40220320-3	Gravimetric and Volumetric Analytical Chemistry	2	1
40220321-2	Qualitative Analytical Chemistry	1	1
40220350-3	Thermodynamics	2	1
605201-2	Quran2	2	-
601201-2	Islamic Culture 2	2	-

LEVEL 4

Course No	Course Name	Credits	
		Theo.	Theo.
4023551-3	Physical Organic Chemistry	3	-
4023552-2	Chemistry of Transition Elements	2	-
4023553-2	Quantum Chemistry	2	-
4023554-3	Surface Chemistry	2	1
4023555-3	Spectrophotometric and Electrochemical Methods of Analysis	2	1
4023556-3	Heterocyclic Chemistry	2	1
605301-2	Quran3	2	-

THIRD YEAR			
LEVEL 5			
Course No	Course Name	Credits	
		Theo.	Theo.
40220440-2	Chemistry of The Main Group Elements	2	-
40220430-3	Chemistry of Aromatic Compounds	2	1
40220450-3	Electrochemistry	2	1
40220451-3	Kinetic Chemistry	2	1
40220420-3	Organic Analytical Chemistry	2	1
40220452-1	Colloids Chemistry and Phase Rule	1	-
601301-3	Islamic Culture 3	3	-

LEVEL 6			
Course No	Course Name	Credits	
		Theo.	Theo.
4023561-3	Organic Spectroscopy	2	1
4023562-3	Separation Methods and Thermal Analysis	2	1
4023563-3	Catalysts Chemistry	2	1
4023564-3	Coordination Chemistry	2	1
4023565-3	Organic Reactions and Preparations	2	1
40235660-3	Summer Training	3	-

FOURTH YEAR

LEVEL 7

Course No	Course Name	Credits	
		Theo.	Theo.
4024571-2	Chemistry of Natural Products	2	-
4024572-3	Chemistry of Petroleum and Petrochemicals	2	1
4024573-2	Reaction Mechanism and spectroscopy	2	-
4024574-2	Environmental Chemistry	2	-
4024575-2	Organometallic Chemistry	2	-
4024576-2	Solution Chemistry and Kinetic Theory of Gases	2	-
4024577-2	Molecular Spectroscopy	2	-
605401-2	Quran4	2	-

LEVEL 8

Course No	Course Name	Credits	
		Theo.	Theo.
4024581-3	Polymer Chemistry	2	1
4024582-2	Solid State Chemistry	2	-
4024583-2	Special Topics in Organic Chemistry	2	-
4024584-2	Nanochemistry	2	-
4024585-2	Chemistry of Energy Resources	2	-
4024586-2	Forensic Chemistry	2	-
4024587-3	Graduation Project	3	-
601401-2	Islamic culture 4	2	-

A- Analytical Chemistry Courses

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Volumetric and Gravimetric Analytical Chemistry

4022133-3

Course Specifications
(CS)

Course Specifications

Institution: **Umm Al-qura University**	Date of Report: **2016**
College/Department : **Faculty of Applied Science/ department of chemistry**	

A. Course Identification and General Information

1. Course title and code: **Volumetric and Gravimetric Analysis Chemistry/ 4022133-3**
2. Credit hours: **4 hrs** (2 theoretical + 1 practical)**.**
3. Program(s) in which the course is offered. **Chemistry**
4. Name of faculty member responsible for the course: **Dr. Marwa El Ghalban**
5. Level/year at which this course is offered: **3rd level / 2rd year**
6. Pre-requisites for this course (if any): **General chemistry1**
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **both on El-Abdyah, and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ☒ What percentage? **100%**

b**. Blended (traditional and online)** What percentage?

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other What percentage

Comments:

B Objectives

1. What is the main purpose for this course?
   - **1.1.** Know the theoretical principle of volumetric and gravimetric analysis.
   - **1.2.** Familiar with statistical methods and solution concentration parameters in chemical measurements
   - **1.3.** Study the procedures required to gravimetric analysis and factors which effect the precipitation process
   - **1.4.** Classify varies titrations and their applications in water analysis and manufacture
   - **1.5.** Using different indicators and pH control in the different titrations
   - **1.6.** Compare between Mohr, Volhard and Fajans methods in precipitation titrations
   - **1.7.** Know difference between (co-precipitation and post-precipitation), (weight form and precipitate form) and the role of different pricipitants

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
a. Classification and applications of quantitative analysis and solution concentration parameters	1	2
b. The principles of volumetric analysis and statistical methods – neutralization titrations theory- pH measurements.	1	2
c. Buffer solutions, their working theory and their applications- Indicators in neutralization titrations and the applications of neutralization titrations in manufacture, pharmaceutical and biochemistry fields	1	2
d. Precipitation theory, adsorption indicators, applications of precipitation titrations and titrations which include complexes formation	1	2
e. Compleximetry titrations and their applications in water analysis and manufacture and reduction – oxidation (Redox) titrations and their applications.	1	2
f. Principles and requirements of gravimetric analysis	1	2
g. Theoretical principles of precipitation and stages of saturated, supersaturated and solubility product, precipitation formation (nucleation, precipitate growth)	1	2
h. Mid Term exam	1	2

i. Factors affecting the solubility of precipitate, precipitation from homogeneous solution and contamination of precipitates ,types of contaminates (co-precipitation, post precipitation, surface adsorption)	1	2
j. The methods of contaminates removing or minimizing	1	2
k. Organic precipitants, requirements and its application Inorganic precipitants, requirements and its application	2	4
l. Calculations of gravimetric analysis	1	2
m. Revisions and preparatory exam	1	2

Laboratory Part:

- **Standardization of hydrochloric acid using 0.1N sodium carbonate.**
- **Determination of sodium hydroxide and sodium carbonate in mixture using hydrochloric acid**
- **Determination of ammonia in ammonium solution using hydrochloric acid**
- **Standardization of potassium permanganate using oxalic acid**
- **Iodometry and Ioditymetry using sodium thiosulphate**
- **Silver nitrate titrations by Volhard and Mohr methods**
- **Standardization of EDTA using zinc sulphate**
- **Determination of water crystallization in barium chloride salt.**
- **Determination of barium ion as barium sulphate.**
- **Determination of aluminum in alum.**
- **Determination of calcium using ammonium oxalate**
- **Determination of lead as lead chromate**
- **Determination of nickel using dimethylglyoxime**

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	-	42			70
Credit	2	-	1			3

3. Additional private study/learning hours expected for students per week.	2 h

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		

	Recognize principles of volumetric and gravimetric analysis in analytical chemistry	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • long and short essays • posters lab manuals
	Identify the classification of volumetric analysis methods		
	Know the analytical measurements and discover the suitable method and requirements for gravimetric analysis and purification		
	Outline the difference between nucleation, precipitate growth and define the concentration parameters		
	Recognize the meaning of indicators and identify the suitable condition of gravimetric analysis and removal of contamination		
	Describe statistical methods in analytical chemistry.		
	Familiar with neutralization titrations and with organic and inorganic precipitants, requirements and its applications		
	Select the proper method of precipitation titrations methods		
	Name the different reduction-oxidation methods		
	Know the principles of compleximetry titrations		
	Recognize the meaning of metalochromic indicators		
	Outline application important		
2.0	**Cognitive Skills**		
	• Apply the suitable methods to refer to concentration parameters • Compare the different types of volumetric analysis and predict the suitable methods for gravimetric analysis • Explain principles of volumetric methods and its classification. Choose the suitable method to purify the precipitate. • Analyze deferent solutions and pH measurements • Create the different ideas to study the precipitation process, contamination, purification • Appraise the volumetric and gravimetric methods in analytical chemistry • Demonstrate neutralization, redox, precipitation and compleximetry titrations and evaluate the types of precipitants and procedures for gravimetric analysis	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • posters • demonstrations
3.0	**Interpersonal Skills & Responsibility**		

	• Ability to work in a team to perform a specific experimental tasks. • Ability to work independently to handle chemicals • Ability to communicate results of work to classmate and participation in class or ab oratory discussions		• Ability to work in a team to perform a specific experimental tasks. • Ability to work independently to handle chemicals • Ability to communicate results of work to classmate and participation in class or ab oratory discussions
4.0	**Communication, Information Technology, Numerical**		
	• Use information and communication technology. • The ability to use e-mail to communicate with the instructor and other students. • Scientific writing. • Use his/her observations to solve problems. • Able to calculate and discuss the facts and logical propose methods to solve the difficulties. • Ability to work in a team to perform a specific task. • Ability to solve problems.	• Lectures • Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
5.0	**Psychomotor**		
	Laboratory practice . including 1.Locate Materials Safety Data Sheets, chemicals carcinogens list, and hazardous chemicals list. 2. Handle chemicals safely with a proper PPE 3.Dilute solutions, repeat analysis and calculate true result for all procedures performed as required. 4.Pipette accurately at all times 5. Titrate and weight efficiently in right way 6.Dispose the hazardous solution in right way	Practical session should include both demonstration and experiments .	1.Repetition of the experiments , to reproduce the results 2.Written report of chart and procedures. 3.The students should be able to correlate their results with experimental conditions

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	Midterm Exam.	8	20 %
3	Practical Exam.	14	30 %
4	Final Exam.(2hours Exam)	16	40 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

- Douglas A. Skoog, Donald M. West, James F. Holler and Stanley R. Crouch, ***Analytical Chemistry***, 7th edition, Springer (2014)
- Gary D. Christian, Purnendu K. Dasgupta and Kevin A. Schug, ***Analytical Chemistry***, 7th edition, WILEY (2014)

2. List Essential References Materials (Journals, Reports, etc.)

- Lecture Hand outs available on the coordinator website

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

-

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com**
- **http://www.sciencedirect.com**
- **http://www.rsc.org**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)
    - **Classrooms capacity (30) students.**
    - **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

- **Room equipped with computer and projector and TV.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

Complete the questionnaire evaluation of the course in particular.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- **Observations and the assistance of colleagues.**
- **Independent evaluation for extent to achieve students the standards.**
- **Iindependent advice of the duties and tasks.**

3 Processes for Improvement of Teaching

- **Workshops for teaching methods.**
- **Continuous training of member staff.**
- **Review of strategies proposed.**
- **Providing new tools for learning.**
- **The application of e-learning.**
- **Eexchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for

improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: **Dr. Dr. Marwa El Ghalban**

Signature: **Date Report Completed: 2018**

Received by: Dr. Ismail Althagafi **Department Head**

Signature: ________________________________ **Date: _______________**

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specifications
(CS)

Qualitative Analytical Chemistry
4022134-2

Course Specifications

Institution: Umm Al-Qura University	Date of Report
College/Department : Applied Science /Chemistry Department	

A. Course Identification and General Information

1. Course title and code: Qualitative Analytical Chemistry/ **4022134-2**

2. Credit hours : 2 hrs (1 theoretical + 1 practical)

3. Program(s) in which the course is offered. **Chemistry**
(If general elective available in many programs indicate this rather than list programs)

4. Name of faculty member responsible for the course: **Dr. Marwa El Ghalban**

5. Level/year at which this course is offered : 3rd level

6. Pre-requisites for this course (if any) : General Chemistry (1)

7. Co-requisites for this course (if any)

8. Location if not on main campus : both on El-Abdyah, and El-Zaher

9. Mode of Instruction (mark all that apply)

a. Traditional classroom	■	What percentage?	100
b. Blended (traditional and online)	☐	What percentage?	
c. e-learning	☐	What percentage?	
d. Correspondence	☐	What percentage?	
f. Other	☐	What percentage?	

B Objectives

1. What is the main purpose for this course? By the end of this course student will be able to know the fundamentals of analytical chemistry and has the ability to identify different methods used for qualitative analysis.
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) encourage students to make reports in the recent trends in the field of analytical chemistry, either from the library or by using the Internet

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Inorganic qualitative analysis: its classifications and its applications	1	1
The solutions (Types of solutions – the solubility and factors effecting solubility – Solubility of aqueous ,ionic and non ionic compounds –methods for expression concentrations	1	1
The chemical equilibrium – The rate of chemical reactions.	1	1
Acid- Base equilibrium, Dissociation of water, pH and Neutralization Indicators	1	1
Hydrolysis of salts, acids and weak base	1	1
Buffer solution in qualitative analysis	1	1
Colloidal solutions (colloidal particles and electric charge – pepitization – colloidal particles precipitation – conditions of ideal precipitation)	2	2
The precipitates and law of solubility product	1	1
Mid term exam	1	1
The factors effecting on the solubility of precipitates and separations of ionic groups.	1	1
equilibrium of complex formation (Coordination complexes, its structure and types of bonds in ionic complexes)	1	1

Types of ionic complexes –application of equilibrium law on complexes reactions - application of complex formationin qualitative analysis	1	1
Oxidation reduction equilibrium	1	1
General revision and preparatory exam	1	1
Laboratory ▪ Identify acidic radicals of first group using dilHCl ▪ Identify acidic radicals of second group and Conc. H_2SO_4 ▪ Identify acidic radicals of third group using $BaCl_2$ ▪ Revision on acidic radicals ▪ Identify basic radicals of first group(Hg_2^{2+}, Pb^{2+}, Ag^+) ▪ Identify basic radicals of second group (Hg^{2+}, Cu^{2+}, Cd^{2+}, Bi^{3+}) ▪ Identify basic radicals of third group (Al^{3+}, Cr^{3+}, Fe^{3+}) ▪ Identify basic radicals of fourth group (Mn^{2+}, Zn^{2+}, Co^{2+}, Ni^{2+}) ▪ Identify basic radicals of fifth group (Sr^{2+}, Ca^{2+}, Ba^{2+}) ▪ Identify basic radicals of sixth group (NH_4^+, Mg^{2+}, Na^+, K^+) ▪ Revision on basic radicals	14	

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	14	-	42			56
Credit	1	-	1	-		2

3. Additional private study/learning hours expected for students per week. 2hr

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		

1.1	Recognize classification and application of qualitative analysis	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • long and short essays posters lab manuals
1.2	Discover the factors affecting on the solubility, precipitation		
1.3	Explain methods to express concentration and Identify chemical , kinetic equilibrium and acid base equilibrium		
1.4	understand ionic and nonionic compounds, electrolytic and non electrolytic		
1.5	Know Colloidal solutions and conditions of ideal precipitation		
1.6	Mention the importance of complex formation as application in qualitative analysis		
2.0	**Cognitive Skills**		
2.1	Develop the reverse think skills and student gains the practical skills to choose the suitable methods for aqueous solutions solubility	1. group discussions 2. case study. 3. home work assignment containing problem thinking activities	1.Midterm exam 2.quizzes 3.Group discussion 4.Final exam
2.2	Gains the skills for acid base equilibrium and Redox equilibrium		
2.3	Select the suitable method for expressing concentration		
2.4	Design different methods to determine the rate of chemical reactions		
2.5	predict conditions of ideal precipitation		
2.6	plan to make research program in qualitative analysis according to systematic steps		
2.7	Compare between the different equations in Redox process		
3.0	**Interpersonal Skills & Responsibility**		
3.1	• Ability to work in a team to perform a specific experimental tasks. • Ability to work independently to handle chemicals • Ability to communicate results of work to classmate and participation in class or ab oratory discussions	• Class discussions • Research activities	• Performance on in-practical exams. • Work on research activity. • Overall student performance in Lab. Discussions • Cross questions after finishing laboratory work
4.0	**Communication, Information Technology, Numerical**		
4.1	Communicate effectively in oral and written forms	1.Write a Report 2.Use digital libraries and/or E-Learning Systems for the communication with lecturer through the course work	1.Evaluating the activities of the students through the semester for their activities on the E-learning system, as well as, their communication with each other in different tasks. 2.Evaluation of the report presented
4.2	Use information and communication technologies Use basic mathematical and statistical techniques		

5.0	**Psychomotor**		
	Laboratory practice . including 1.Locate Materials Safety Data Sheets, chemicals carcinogens list, and hazardous chemicals list. 2. Handle chemicals safely with a proper PPE 3.Dilute solutions, repeat analysis and calculate true result for all procedures performed as required. 4.Pipette accurately at all times 5. weight efficiently in right way 6.Dispose the hazardous solution in right way	Practical session should include both demonstration and experiments .	1.Repetition of the experiments , to reproduce the results 2.Written report of chart and procedures. 3.The students should be able to correlate their results with experimental conditions

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	Midterm Exam.	8	20 %
3	Practical Exam.	14	30 %
4	Final Exam.(2hours Exam)	16	40 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- We have faculty members to provide counseling and academic advice.
- 2 hours per week as office hours are available for discussion with the students.

E. Learning Resources

1. List Required Textbooks

- Douglas A. Skoog, Donald M. West, F. James Holler, Stanley R. Crouch. Fundamentals of analytical chemistry , 9 edition , Brooks Cole (2014)
- Gary D. Christian, Purnendu K. Dasgupta and Kevin A. Schug, Analytical Chemistry, 7th edition, WILEY (2014).

2. List Essential References Materials (Journals, Reports, etc.)

- Lecture Hand outs available on the coordinator website

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- http://en.wikipedia.org/wiki/Petroleum1- http://www.chemhelper.com/
- http://www.chemweb.com/
- http://www.science.uwaterloo.ca/~cchieh/cact/

http://www.sciencedirect.com/

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

- Microsoft Power Point and Microsoft Word
- Qualitative analysis video
- Teaching CD for qualitative analysis

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- Classrooms capacity (30) students.

Providing hall of teaching aids including computers and projector.

2. Computing resources (AV, data show, Smart Board, software, etc.)

Room equipped with computer and projector and TV

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Student discussion with the instructor allow for continuous feed back through the course progress.
- Student Evaluation Questionnaires.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- Discussions within the group of faculty teaching the course.
- Peer consultation on teaching strategies and its effectiveness.

3 Processes for Improvement of Teaching

- Workshops given by experts on new teaching and learning methodologies will be attended.

Improving of the teaching strategies by monitoring the evaluation of the students progress through the semester

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

Not effective yet.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- The course will be evaluated periodically after each semester based on the results of the students and the report presented by the teaching stuff that will be discussed with the course coordinator so as to improve the course.

Faculty or Teaching Staff: ______ Dr. Marwa El Ghalban _____________

Signature: ________________________________ Date Report Completed: _2018___________

Received by: Dr. Ismail Althagafi Department Head

Signature: ________________________________ Date: _______________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Organic analytical chemistry

4022145-3

Institution: **Umm Al-qura University** Date of Report: **2017**

College/Department : **Faculty of Applied Science/ department of chemistry**

A. Course Identification and General Information

1. Course title and code: **Organic Analytical Chemistry/4022145-3**
2. Credit hours: **3 hrs** (2 theoretical + 1 practical)**.**
3. Program(s) in which the course is offered. **Chemistry program**
4. Name of faculty member responsible for the course: **Prof. Amr L Saber**
5. Level/year at which this course is offered: **4th level / 2rd year**
6. Pre-requisites for this course (if any): **Volumetric Analysis Chemistry**
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **both on El-Abdyah, and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom	☒	What percentage?	**100%**
b. Blended (traditional and online)		What percentage?	
c. e-learning	☐	What percentage?	☐
d. Correspondence	☐	What percentage?	☐
f. Other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course? **1.1.** Demonstration analytical methods which include the analysis of organic compounds **1.2.** Know the different function groups in organic compounds **1.3.** Determination of the state of unsaturation in organic compounds **1.4.** Stress the different analytical methods to determine organic compounds in real samples **1.5.** Recognize the formation method of oxime
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) **The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course**

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact Hours
1. Determination of elements in organic compounds	2	4
2. Determination of Carboxylic acids	1	2
3. Determination of esters	1	2
4. Determination of amino groups	1	2
5. Determination of hydroxylic groups	1	2
6. Determination of carbonyl groups and their derivatives	2	4
7. Determination of nitro and nitroso groups	1	2
8. Determination of the state of unsaturation in organic compounds	1	2
9. Determination of organic peroxide	1	2
10. Determination of isothiocynate and isocynate	1	2
11. Discussion the formation method of oxime (equilibrium and kinetic study) as a model in organic analytical chemistry	2	4

Laboratory Part:

- **Determination of elements(C, H, O, N,…) in organic compounds.**
- **Determination of formaldehyde concentrations in their solutions**
- **Determination of acetone concentrations in their solutions**
- **Determination of amino and hydroxyl groups**
- **Determination of equivalent weight for carboxylic acid**
- **Determination of the strength of aniline solution**
- **Determination of reduced saccharide**
- **Determination of the equivalence of ester saponification**
- **Determination of amino-acids**

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	-	42			70
Credit	2	-	1			3

3. Additional private study/learning hours expected for students per week. 2 h

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Recognize principles of organic analysis in analytical chemistry.	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • long and short essays • posters lab manuals
1.2	Identify the classification of organic analysis methods		
1.3	Know the procedures of elemental analysis		
1.4	Define the concentration parameters		
1.5	Recognize the meaning of equivalent weight and saponification		
1.6	Describe statistical methods in organic analysis.		
1.7	Select the proper method to determine the strength of aniline solution		
1.8	Demonstrate the state of unsaturation in organic compounds		
1.9	Recognize the formation method of oxime (equilibrium and kinetic study) as a model in organic analytical chemistry		
1.10	Outline application important		
2.0	**Cognitive Skills**		
2.1	Apply the suitable methods for elemental analysis	• Lectures • Scientific discussion	• Exams • web-based student performance systems
2.2	Compare the different types of hetero-organic compounds analysis		

2.3	Explain principles of organic analysis methods and its classification	• Library visits • Web-based study	• portfolios • posters • demonstrations
2.4	Analyze deferent amino-acids compounds		
2.5	Summarize the principles of organic analysis		
3.0	**Interpersonal Skills & Responsibility**		
• Ability to work in a team to perform a specific experimental tasks. • Ability to work independently to handle chemicals • Ability to communicate results of work to classmate and participation in class or ab oratory discussions		• Class discussions • Research activities	• Performance on in-practical exams. • Work on research activity. • Overall student performance in Lab. discussions • Cross questions after finishing laboratory work
4.0	**Communication, Information Technology, Numerical**		
• Use information and communication technology. • Scientific writing. • Use his/her observations to solve problems. • Doing research and conduct searches for restoring information. • Able to calculate and discuss the facts and logical propose methods to solve the difficulties.		• Lectures • Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
5.0	**Psychomotor**		
Laboratory practice . including 1.Locate Materials Safety Data Sheets, chemicals carcinogens list, and hazardous chemicals list. 2. Handle chemicals safely with a proper PPE 3.Dilute solutions, repeat analysis and calculate true result for all procedures performed as required. 4.Pipette accurately at all times 5. Titrate and weight efficiently in right way 6.Dispose the hazardous solution in right way		Practical session should include both demonstration and experiments .	1.Repetition of the experiments , to reproduce the results 2.Written report of chart and procedures. 3.The students should be able to correlate their results with experimental conditions

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment

1	Homework or activities.	--	10 %
2	Midterm Exam.	8	20 %
3	Practical Exam.	14	30 %
4	Final Exam.(2hours Exam)	16	40 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks
- Douglas A. Skoog, Donald M. West, James F. Holler and Stanley R. Crouch, ***Analytical Chemistry***, 7th edition, Springer (2014)

2. List Essential References Materials (Journals, Reports, etc.)
- Lecture Hand outs available on the coordinator website

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)
- Gary D. Christian, Purnendu K. Dasgupta and Kevin A. Schug, ***Analytical Chemistry***, 7th edition, WILEY (2014)
- Douglas A. Skoog, Donald M. West, James F. Holler and Stanley R. Crouch, *Analytical Chemistry*, 7th edition, Springer (2014)
- Dhruba Charan Dash. *Analytical Chemistry* (2017) PHI Learning Private Limited.

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)
- **http://www.chemweb.com**
- **http://www.sciencedirect.com**
- **http://www.rsc.org**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- **Classrooms capacity (30) students.**
- **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

- **Room equipped with computer and projector and TV.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

Complete the questionnaire evaluation of the course in particular.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- **Observations and the assistance of colleagues.**
- **Independent evaluation for extent to achieve students the standards.**
- **Iindependent advice of the duties and tasks.**

3 Processes for Improvement of Teaching

- **Workshops for teaching methods.**
- **Continuous training of member staff.**
- **Review of strategies proposed.**
- **Providing new tools for learning.**
- **The application of e-learning.**
- **Exchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**

- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: **Prof. Amr L Saber**

Signature: **Date Report Completed: 2018**

Received by: Dr. Ismail Althagafi **Department Head**

Signature: ________________________________ Date: _______________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Spectrophotometric and Electrochemical techniques

4023555-3

Course Specifications
(CS)

Course Specifications

Institution: **Umm Al-qura University** Date of Report: 2017

College/Department : **Faculty of Applied Science/ Department of Chemistry**

A. Course Identification and General Information

1. Course title and code: **Spectrophotometric and Electrochemical techniques /4023555-3**
2. Credit hours: **3 hrs** (2 theoretical + 1 practical)
3. Program(s) in which the course is offered. **Chemistry**
4. Name of faculty member responsible for the course: **Prof. Amr L Saber**
5. Level/year at which this course is offered: **5th level/3rd year**
6. Pre-requisites for this course (if any): **Volumetric analysis**
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **both on El-Abdyah, and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ■ What percentage? 100%

b**. Blended (traditional and online)** What percentage?

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage? ☐

Comments:

B Objectives

1. What is the main purpose for this course? **By the end of this course student have all information about the instrumental analysis and have ability to determine the trace amounts of different compounds and metals.**
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) **The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course**

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
a. General properties of electromagnetic radiation and its interaction with matter, the electromagnetic spectrum as well as the absorption and emission of electromagnetic radiation.	2	4
b. Atomic spectra, molecular spectra, scattered radiation, refracted radiation, dispersed and diffracted radiation, monochromatic vs. polychromatic radiation.	1	2
c. Instrumentation, radiation sources, monochromators, sample cell (cuvette), detectors, single-beam and double-beam spectrophotometers and photometers.	1	2
d. Ultraviolet and visible molecular absorption spectroscopy, Beer's law, true and apparent deviations from Beer's law, application of Beer's law to mixtures, calibration curve and the standard addition method.	1	2
e. Absorbing species, absorption by organic compounds, charge-transfer absorption and ligand-field absorption bands.	1	2
f. Qualitative and quantitative analysis by UV-Vis. Applications of spectrophotometric methods in chemical equilibrium studies, spectrophotometric titrations	1	2
g. Turbidimetry and nephelometry	1	2
h. Molecular fluorescence spectroscopy, theory of molecular fluorescence, relaxation process, resonance lines and stokes shifts, relationship between excitation spectra and fluorescence spectra, effect of structure, temperature and solvents on fluorescence, effect of concentration on fluorescence intensity, instrumentation and applications in organic and inorganic analysis.	1	2

i. Flame emission and atomic absorption spectroscopy, nebulisation, burners and nebulizers, flames and flame temperature, interferences, flame spectrometric techniques, flame emission spectrometry, flame photometer, flame atomic absorption spectrometry and applications	2	4
j. Introduction to electroanalytical methods, pH and ion selective potentiometry, glass-membrane electrodes, solid-state sensors, liquid-membrane electrodes, gas-sensing and enzyme electrodes, interferences, potentiometric titrations	1	2
k. Voltammetry, polarography and amperometric titrations, current-voltage relationships, characteristics of dropping mercury electrode, half-wave potential, modern voltammetric techniques (ASV and CSV), instrumentation, applications, two indicator electrodes amperometric titrations	1	2
l. Electrogravimetry and calorimetry, basic principles, equipment for electrolytic separation, electrogravimetry, coulometry and coulometric titrations, conductance methods, electrolytic conductivity, measurement of electrolytic conductance, direct concentration determination, conductometric titrations	1	2

Labortory Part:

- Determine copper in copper sulphate solution using spectrophotometric methods
- Determine iron in its salt solution using spectrophotometric methods
- Study reduction oxidation reactions by spectrophotometric methods
- Analysis of $KMnO_4$ and $K_2Cr_2O_7$ in mixture using UV-Vis. spectrophotometer
- Determination of copper using potentiometric titration
- Potentiometric EDTA titrations with the mercury electrode
- Determination of ascorbic acid in fruit juice using Polarographic method
- Determination of amino acids in their solutions
- Determination of hydroxyl group number

II-General scheme for identification of organic aliphatic unknown

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	-	36	-	-	64
Credit	2	-	1	-	-	3

3. Additional private study/learning hours expected for students per week. 2 h

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	**Course Teaching Strategies**	**Course Assessment Methods**
1.0	**Knowledge**		
1.1	Describe the principles and applications of spectrophotometric and colormetric analysis	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • long and short essays • posters lab manuals
1.2	Identify electromagnetic spectrum and its interaction with matter		
1.3	Define absorption and emission of light by atoms and molecules-types of analysis and devices		
1.4	Recognize the spectrophotometric measurements theory and Beer's law deviation		
1.5	Familiar with spectrophotometric instrumentation – spectra measurements using UV-vis and IR		
1.6	Outline atomic absorption by electrothermal oven- X ray analysis – Applications		
1.7	Write an atomic emission spectroscopy and the interference study		
1.8	Determine the electrochemical methods in quantitative analysis – Introduction to the principles		
1.9	Recognize the potentiometric methods and Potentiometric titrations		
1.10	Memorize voltammetry and polarography techniques		
1.11	Outline conductmetric methods and their titrations		
2.0	**Cognitive Skills**		
2.1	Analyze electromagnetic spectrum and its interaction with matter	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • posters • demonstrations
2.2	Summarize the principles and applications of spectrophotometric and colormetric analysis		
2.3	Explain the turbidity analysis and flame photometry		
2.4	Apply Beer's law applications		
2.5	Interpret the inductively coupled plasma (ICP)– principles and applications		
2.6	Compare between voltammetry and polarography techniques		
2.7	Measure using conductmetric methods and their titrations Evaluate atomic absorption by electrothermal oven- X ray analysis – Applications Demonstrate potentiometric methods and Potentiometric titrations		
3.0	**Interpersonal Skills & Responsibility**		

• Ability to work in a team to perform a specific experimental tasks. • Ability to work independently to handle chemicals • Ability to communicate results of work to classmate and participation in class or ab oratory discussions	• Class discussions • Research activities	• Performance on in-practical exams. • Work on research activity. • Overall student performance in Lab. discussions • Cross questions after finishing laboratory work
4.0	**Communication, Information Technology, Numerical**	
1. Encourage students to use internet for searching certain electronic journals regarding topics of the course. 2. Scientific writing. 3. Use his/her observations to solve problems. 4. Doing research and conduct searches for restoring information. 5. Able to calculate and discuss the facts and logical propose methods to solve the difficulties.	• Lectures • Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
5.0	**Psychomotor**	
Laboratory practice . including 1.Locate Materials Safety Data Sheets, chemicals carcinogens list, and hazardous chemicals list. 2. Handle chemicals safely with a proper PPE 3.Dilute solutions, repeat analysis and calculate true result for all procedures performed as required. 4.Pipette accurately at all times 5. Titrate and weight efficiently in right way 6.Dispose the hazardous solution in right way	Practical session should include both demonstration and experiments .	1.Repetition of the experiments , to reproduce the results 2.Written report of chart and procedures. 3.The students should be able to correlate their results with experimental conditions

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	Midterm Exam.	8	20 %
3	Practical Exam.	14	30 %
4	Final Exam.(2hours Exam)	16	40 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

- K. Danzer, ***Analytical Chemistry, Theoretical and Metrological Fundamentals***, Springer(2014)

2. List Essential References Materials (Journals, Reports, etc.)

- Lecture Hand outs available on the coordinator website

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

- Gary D. Christian, Purnendu K. Dasgupta and Kevin A. Schug, ***Analytical Chemistry***, 7th edition, WILEY (2014)
- Douglas A. Skoog, Donald M. West, James F. Holler and Stanley R. Crouch, ***Analytical Chemistry***, 7th edition, Springer (2014)
- Dhruba Charan Dash. *Analytical Chemistry* (2017) PHI Learning Private Limited.

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com**
- **http://www.sciencedirect.com**
- **http://www.rsc.org**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) • **Classrooms capacity (30) students.** • **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.) ▪ **Room equipped with computer and projector and TV.**
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) • **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching Complete the questionnaire evaluation of the course in particular.
2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor • **Observations and the assistance of colleagues.** • **Independent evaluation for extent to achieve students the standards.** • **Independent advice of the duties and tasks.**
3 Processes for Improvement of Teaching • **Workshops for teaching methods.** • **Continuous training of member staff.** • **Review of strategies proposed.** • **Providing new tools for learning.** • **The application of e-learning.** • **Exchange of experiences internal and external.**
4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) ▪ **Check marking of a sample of exam papers, or student work.** ▪ **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: Prof. Amr L Saber

Signature: Date Report Completed: 2018

Received by: Dr. Ismail Althagafi Department Head

Signature: ________________________________ Date: _______________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Separation Methods and Thermal Analysis

4023562-3

Course Specifications
(CS)

Course Specifications

Institution: **Umm Al-qura University** Date of Report: **2015**

College/Department : **Faculty of Applied Science/ department of chemistry**

A. Course Identification and General Information

1. Course title and code: **Separation Methods and Thermal Analysis / 4023562-3**
2. Credit hours: **3 hrs** (2 theoretical + 1 practical)
3. Program(s) in which the course is offered. **Chemistry**
4. Name of faculty member responsible for the course: **Dr. Mohammed Kassem**
5. Level/year at which this course is offered: **6th level / 3rd year**
6. Pre-requisites for this course (if any): **Spectrophotometric and Electrochemical techniques 402311-3**
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **both on El-Abedyah, and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ☒ What percentage? **100%**

b**. Blended (traditional and online)** ☐ What percentage? ☐
c. e-learning What percentage?

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage?

Comments:

B Objectives

1. What is the main purpose for this course?

By the end of this course the students will

1. **Have all information about mixtures in chemistry**
2. **Familiar with separation process and methods of thermal analysis.**
3. **Able to use many separation tools for separate both organic and in organic mixtures.**

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
1. Separation methods in analytical chemistry, classifications , and solvent extraction technique	2	4
2. Principles of chromatographic methods and its classification	1	2
3. Column chromatography	1	2
4. Liquid-liquid chromatography and Solid-liquid chromatography	1	2
5. Ion exchanger chromatography, ionic chromatography and HPLC	1	2
6. Plane chromatography	1	2
7. Thin layer chromatography (TLC), paper chromatography (PC) and electrophoresis method	1	2
8. Gas chromatography	2	4
9. Gas chromatography in qualitative, quantitative, medical and petroleum analysis	1	2
10. Principles and devices of previous analysis methods	1	2
11. Thermal analysis methods: thermo gravimetric analysis (TGA), (DTG), (DSC) and (DTA)	1	2
12. Calometric analysis and thermal titrations	1	2

Laboratory Part:

- **Solvent extraction of iodine from aqueous layer to organic layer.**
- **Choosing suitable solvent for separation mixture of inks or amino acids using paper chromatography.**
- **Halides separation using thin layer chromatography.**

- **Determination of total concentration of cations in water sample using ion-exchange chromatography.**
- **Using GC to determine retention time, flow rate and internal standard solution then determine pentanol in unknown sample.**
- **Chemical equilibrium measurement using GC for the reaction of methyl acetate with ethyl alcohol.**
- **Determination fatty acid by GC.**
- **Determination of alcohol by GC.**
- **Determination of benzoic acid in beverages by GC.**
- **Determination of drugs in pharmaceuticals using HPLC.**

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	-	42			70
Credit	2	-	1			3

3. Additional private study/learning hours expected for students per week. 2 h

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	**Course Teaching Strategies**	**Course Assessment Methods**
1.0	**Knowledge**		
1.1	Recognize the separation methods in analytical chemistry, classifications , and solvent extraction technique	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • long and short essays • posters lab manuals
1.2	Identify the principles of chromatographic methods and its classification		
1.3	Know the principles of column chromatography		
1.4	Describe liquid-liquid chromatography and Solid-liquid chromatography		
1.5	Familiar with plane chromatography		
1.6	Select the proper method of preparation of an organic molecule		
1.7	Name the different conformations of alkanes and cycloalkanes		
1.8	Determine principles and devices of previous analysis methods		
1.9	Recognize thin layer chromatography (TLC), paper chromatography (PC) and electrophoresis		

	method		
1.10	Memorize the thermal analysis methods		
1.11	Outline calometric analysis		
1.12	Define thermal titrations		
2.0	**Cognitive Skills**		
2.1	Apply separation methods in analytical chemistry	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • posters • demonstrations
2.2	Compare calometric analysis and thermal titrations		
2.3	Explain the principles of chromatographic methods and its classification		
2.4	Analyze liquid-liquid chromatography and Solid-liquid chromatography		
2.5	Summarize the principles and devices of GC and HPLC		
3.0	**Interpersonal Skills & Responsibility**		
• Ability to work in a team to perform specific experimental tasks. • Ability to work independently to handle chemicals • Ability to communicate results of work to classmate and participation in class or ab oratory discussions		• Class discussions • Research activities	• Performance on in-practical exams. • Work on research activity. • Overall student performance in Lab. discussions • Cross questions after finishing laboratory work
4.0	**Communication, Information Technology, Numerical**		
• Use information and communication technology. • The ability to use e-mail to communicate with the instructor and other students. • Scientific writing. • Use his/her observations to solve problems. • Able to calculate and discuss the facts and logical propose methods to solve the difficulties.		• Lectures • Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
5.0	**Psychomotor**		
Laboratory practice . including 1.Locate Materials Safety Data Sheets, chemicals		Practical session should include both	1.Repetition of the experiments , to reproduce

carcinogens list, and hazardous chemicals list. 2. Handle chemicals safely with a proper PPE 3. Dilute solutions, repeat analysis and calculate true result for all procedures performed as required. 4.Pipette accurately at all times 5. Titrate and weight efficiently in right way 6.Dispose the hazardous solution in right way	demonstration and experiments.	the results 2. Written report of chart and procedures. 3.The students should be able to correlate their results with experimental conditions

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
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3	Practical Exam.	14	30 %
4	Final Exam.(2hours Exam)	16	40 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

- Douglas A. Skoog, Donald M. West, James F. Holler and Stanley R. Crouch, ***Analytical Chemistry***, 7th edition, Springer (2014)

2. List Essential References Materials (Journals, Reports, etc.)

- Lecture Hand outs available on the coordinator website

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

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4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com**
- **http://www.sciencedirect.com**
- **http://www.rsc.org**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)
   - **Classrooms capacity (30) students.**
   - **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

   - **Room equipped with computer and projector and TV.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)
   - **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching
Complete the questionnaire evaluation of the course in particular.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor
- **Observations and the assistance of colleagues.**
- **Independent evaluation for extent to achieve students the standards.**
- **Iindependent advice of the duties and tasks.**

3 Processes for Improvement of Teaching
- **Workshops for teaching methods.**
- **Continuous training of member staff.**
- **Review of strategies proposed.**
- **Providing new tools for learning.**
- **The application of e-learning.**
- **Eexchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: Dr. Mohammed Kassem

Signature: Date Report Completed: 2018

Received by: Dr. Ismail Althagafi Department Head

Signature: ________________________________ Date: _______________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Environmental Chemistry

4024574-2

Course Specifications
(CS)

Course Specifications

Institution: **Umm Al-qura University** Date of Report: **2015**

College/Department : **Faculty of Applied Science/ department of chemistry**

A. Course Identification and General Information

1. Course title and code: **Environmental Chemistry / 4024574-2**
2. Credit hours: **2**
3. Program(s) in which the course is offered. **Chemistry program**
4. Name of faculty member responsible for the course: **Dr. Mohammed Kassem**
5. Level/year at which this course is offered: **6th level / 3rd year**
6. Pre-requisites for this course (if any): **separation tech and thermal analysis**
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **both on El-Abedyah, and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ■ What percentage? **100%**

b**. Blended (traditional and online)** What percentage?

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage?

Comments:

B Objectives

1. What is the main purpose for this course? **By the end of this course the students will** **1- Have all information about the basis environmental chemistry** **2- Familiar with air, water and soil pollution** **3- Gases cycle in the atmosphere**
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) **The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course**

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
a. Introduction	1	2
b. Principles of environmental chemistry and chemical analysis	2	4
c. Energy and energy cycles and gases cycles	2	2
d. Role of human in environmental pollution	1	2
e. Atmosphere chemistry	1	2
f. Air pollution (classification-sources –problems-global warming phenomenon)	2	4
g. Water treatment chemistry	1	2
h. Water pollution (water quality- types of contaminants- water pollution control)	2	4
i. Soil chemical analysis	2	2

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	24	-		-		24
Credit	2	-		-		2

3. Additional private study/learning hours expected for students per week. 2 h

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	**Course Teaching Strategies**	**Course Assessment Methods**
1.0	**Knowledge**		
1.1	Recognize the meaning of environment and methods in analytical chemistry related to the pollution	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • long and short essays • posters lab manuals
1.2	Identify the principles of energy resources		
1.3	Know the principles of energy cycles		
1.4	Describe some gases cycles		
1.5	Familiar with global warming phenomenon		
1.6	Select the proper method of analysis		
1.7	Name the different classes of air, water and soil pollution		
1.8	Determine principles of atmosphere chemistry		
2.0	**Cognitive Skills**		
2.1	Apply analytical methods in environmental pollution	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • posters • demonstrations
2.2	Compare different types of pollutions		
2.3	Explain the principles air, water and soil pollutions		
2.4	Analyze control methods for water , air and soil pollutions		
2.5	Summarize the principles of atmosphere chemistry		
3.0	**Interpersonal Skills & Responsibility**		
		•	•
4.0	**Communication, Information Technology, Numerical**		
4.1	Appraise the treatments for pollution in analytical chemistry	• Lectures • Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
5.0	**Psychomotor**		
5.1	NOT APPLICABLE		
5.2			

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Exams	8-14	40%
2	Assignments		10%
3			
4	Final Exam.(2hours Exam)	16	50%

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

- **Donald L. Sparks**, ***Environmental Soil Chemistry***, 2nd Edition, Academic Press (2003)
- Stanley E. Manahan, ***ENVIRONMENTAL SCIENCE, TECHNOLOGY, AND CHEMISTRY,*** 2000, CRC Press LLC

2. List Essential References Materials (Journals, Reports, etc.)

- Lecture Hand outs available on the coordinator website

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

- Gary D. Christian, Purnendu K. Dasgupta and Kevin A. Schug, ***Analytical Chemistry***, 7th edition, WILEY (2014)

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com**
- **http://www.sciencedirect.com**
- **http://www.rsc.org**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- **Classrooms capacity (30) students.**
- **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

- **Room equipped with computer and projector and TV.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching
Complete the questionnaire evaluation of the course in particular.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- **Observations and the assistance of colleagues.**
- **Independent evaluation for extent to achieve students the standards.**
- **Independent advice of the duties and tasks.**

3 Processes for Improvement of Teaching

- **Workshops for teaching methods.**
- **Continuous training of member staff.**
- **Review of strategies proposed.**
- **Providing new tools for learning.**
- **The application of e-learning.**
- **Exchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: **Dr. Mohammed Kassem**

Signature: **Date Report Completed: 2018**

Received by: Dr. Ismail Althagafi **Department Head**

Signature: ________________________________ **Date: _______________**

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specifications
(CS)

Forensic Chemistry

4024586-2

Course Specifications

Institution: Umm Al-Qura University Date of Report

College/Department : Applied Science /Chemistry Department

A. Course Identification and General Information

1. Course title and code:
Forensic Chemistry - **4024586-2**

2. Credit hours: 2 hrs (theoretical).

3. Program(s) in which the course is offered. Chemistry
(If general elective available in many programs indicate this rather than list programs)

4. Name of faculty member responsible for the course : **Dr. Mohammed Kassem**

5. Level/year at which this course is offered : 8th level /4th year

6. Pre-requisites for this course (if any) : Separation methods and thermal analysis

7. Co-requisites for this course (if any)

8. Location if not on main campus : **both in El-Abdyah and El-Zaher**

9. Mode of Instruction (mark all that apply)

a. Traditional classroom ☒ What percentage? 100

b. Blended (traditional and online) ☐ What percentage? ☐

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage? ☐

Comments:

B Objectives

1. What is the main purpose for this course? The main objective of this course are to: **• Know introduction in forensic chemistry and quality in chemical analysis.** **• Describe techniques to obtain representive sampling and problems associated during sample preparation.** **• Provide the student a background in statistical analysis of data** **• Describe basic instrumentation used in forensics analysis and the principles behind their function.** **• Familiarize the student with the methodologies involved in analysing forensic samples including: fingerprints, , hair, Forgery of Banknotes , documents**
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) encourage students to make reports in the recent trends in the field of forensic chemistry, either from the library or by using the Internet

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact Hours
1. Introduction to forensic chemistry.	1	2
2. The quality in chemical analysis - quality assurance - quality control - quality management - Internal quality control - External quality control	1	2
3 Statistics used in Analyzing the results (Absolute uncertainty, relative uncertainty, mean value, random error, systematic error - absolute error, standard deviation (the population, the sample), accuracy, precision, variance, %RSD, 95% confidence interval,).	2	4
4. Sample preparation, representative sampling techniques, reproducibility, replicates, duplicates, external standard, internal standard and matrix effect. Analytical problems associated with the preparation of the sample for analysis , Selecting the suitable analytical procedure	1	2
5. The most important analytical devices used in the chemical analysis process to analyze the ambiguity of the crime scene in forensic Chemistry (Gas chromatography mass spectrometry, Scanning electron microscope device, Gas chromatography	1	2
Mid Term exam	1	2
6. video Comparative spectrum device , A highly efficient liquid chromatography, atomic absorption spectrometry, Ultraviolet and visible spectrometer ,)	1	2

7. Infrared device , Automated fingerprint system - Genetic Analysis System- Light microscopes	1	2
8. - Analysis of Forensic Samples - Drug Analysis - Inks, Paints, Pigments, Blood Alcohol Analysis	1	2
9. - applications of analytical chemistry in the hair analysis - fingerprinting - forgery of banknotes and documents	1	2
10. The use of analytical chemistry in the analysis of toxins (drug analysis) - Chemical - abusive drugs	2	4
Revisions and preparatory exam	1	2

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	-	-	-		28
Credit	2	-	-	-		2

3. Additional private study/learning hours expected for students per week. 2hr

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	**Course Teaching Strategies**	**Course Assessment Methods**
1.0	**Knowledge** The student should be able to		
1.1	•know the science of forensic chemistry.	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • long and short essays posters lab manuals
1.2	• Differentiate between quality assurance - quality control - quality management - Internal quality control - External quality control.		
1.3	• Explain how to take a representative sample for analysis and the associated problems during sample preparation.		
1.4	• Understand how spectroscopic and analytical methods are used to analyze forensic samples.		
1.5	Mention instrumentation used in forensics analysis		

	and the principles behind their function		
2.0	**Cognitive Skills** The student should be able to		
2.1	• discuss statistical analysis of data	1. group discussions 2. case study. 3. home work assignment containing problem thinking activities	1.Midterm exam 2.quizzes 3.Group discussion 4.Final exam
2.2	• Compare the different analytical methods used in forensics analysis		
2.3	• Plan to make research program in forensic according to systematic steps		
2.4	• Discussthe quality in chemical analysis.		
2.5	• Choose the suitable analytical device to analyze real samples in forensic chemistry		
2.6	• Conclude the importance of analytical chemistry in studying forensic chemistry		
3.0	**Interpersonal Skills & Responsibility**		
		1. Team work groups for cooperative work making. 2. Presenting the analysis and interpretation of a case study for each group to the other groups in class. 3.Open a general discussion with students in the area of educational issues for knowledge transfer between the students.	1.Writing group scientific report for a case study. 2.Assessment of the solution of problems submitted by the students.
	Working effectively in groups and exercise leadership when appropriate		
4.0	**Communication, Information Technology, Numerical**		
4.1	Communicate effectively in oral and written forms	1.Write a Report 2.Use digital libraries and/or E-Learning Systems for the communication with lecturer through the course work	1.Evaluating the activities of the students through the semester for their activities on the E-learning system, as well as, their communication with each other in different tasks. 2.Evaluation of the report presented
4.2	Use information and communication technologies Use basic mathematical and statistical techniques		
5.0	**Psychomotor**		
5.1	NOT APPLICABLE		
5.2			

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	First Periodic Exam.	6	20 %
3	Second Periodic Exam.	12	20 %
4	Final Exam.(2h exam)	16	50 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- We have faculty members to provide counseling and academic advice.
- 2 hours per week as office hours are available for discussion with the students.

E. Learning Resources

1. List Required Textbooks

- 1- Ho, M. H. Analytical Methods in Forensic Chemistry, Ellis Horwood, Ltd., London, 1990.
- 2- Saferstein, R. Criminalistics; An Introduction to Forensic Science, 5th Ed., Prentice-Hall, Inc., NY, 1994.
- 3- Tebbett, I., Ed., Gas Chromatography in Forensic Science, Ellis Horwood, Ltd., London, 1993.
- 4- Lowry, W. T. Forensic Toxicology: Controlled Substances and Dangerous Drugs, Plenum Publ. Co., NY, 1979.
- 5- Yinon, J., Ed., Forensic Applications of Mass Spectrometry (Modern Mass Spectrometry), CRC Press, Boca Raton, FL, 1995.
- 6- Jay A. Siegel, Forensic Chemistry: Fundamentals and Applications, Wiley & Sons, 2015.
- Lawrence Kobilinsky, Forensic Chemistry Handbook, Wiley & Sons, 2012.

2. List Essential References Materials (Journals, Reports, etc.)

- Lecture Hand outs available on the coordinator website

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- http://en.wikipedia.org/wiki/Petroleum1- http://www.chemhelper.com/
- http://www.chemweb.com/
- http://www.science.uwaterloo.ca/~cchieh/cact/

http://www.sciencedirect.com/

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

- Microsoft Power Point and Microsoft Word
- Qualitative analysis video
- Teaching CD for qualitative analysis

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- Classrooms capacity (30) students.

Providing hall of teaching aids including computers and projector.

2. Computing resources (AV, data show, Smart Board, software, etc.)

Room equipped with computer and projector and TV

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Student discussion with the instructor allow for continuous feed back through the course progress.
- Student Evaluation Questionnaires.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- Discussions within the group of faculty teaching the course.
- Peer consultation on teaching strategies and its effectiveness.

3 Processes for Improvement of Teaching

- Workshops given by experts on new teaching and learning methodologies will be attended.

Improving of the teaching strategies by monitoring the evaluation of the students progress through the semester

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

Not effective yet.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- The course will be evaluated periodically after each semester based on the results of the students and the report presented by the teaching stuff that will be discussed with the course coordinator so as to improve the course.

Faculty or Teaching Staff: ___ Dr. Mohammed Kassem _________________________

Signature: _________________________________ Date Report Completed: __2018____________

Received by: Dr. Ismail Althagafi Department Head

Signature: _________________________________ Date: ________________

B- Physical Chemistry Courses

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Chemistry of Aliphatic Compounds

4022132-3

Course Specifications
(CS)

Course Specifications

Institution: **Umm Al-qura University** Date of Report: **2015**

College/Department : **Faculty of Applied Science/ department of chemistry**

A. Course Identification and General Information

1. Course title and code: **Chemistry of Aliphatic Compounds/ 4022132-3**
2. Credit hours: **3 hrs (2 theoretical + 1 practical)**
3. Program(s) in which the course is offered. **Chemistry program**
4. Name of faculty member responsible for the course: **Professor Mohamed Rabie**
5. Level/year at which this course is offered: **2rd level/1st year**
6. Pre-requisites for this course (if any): **General Chemistry 1**
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **both on El-Abdyah and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ☒ What percentage? **100%**

b**. Blended (traditional and online)** What percentage?

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage? ☐

Comments:

B Objectives

1. What is the main purpose for this course? **By the end of this course student will be familiar with nomenclature, chemical properties and synthesis of aliphatic compounds**
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) **The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course**

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Nomenclature of Hydrocarbons	1	2
Alkanes (Preparation, physical properties, chemical reactions cycloalkanes, conformations in cycloalkanes)	1	2
Alkenes (Preparation, physical properties, chemical reactions conjugated dienes, free radical addition, Diels alder reaction, and 1,4 cycloadditions in dienes	2	4
Alkynes (Preparation, Acidity of terminal alkynes, chemical reactions, induserial uses of alkynes)	1	2
Alkyl halides and dihalides (nomenclature, preparations and reactions)	1	2
Alcohols anddihydric and trihydric alcohols (nomenclature, chemical properties) and thioalcohols	1	2
Ethers (nomenclature, preparations and chemical properties) and thioethers	1	2
Organometallic compounds and Grignard reagents	1	2
Carbonyl compounds (nomenclature, preparation and chemical properties	2	4
Carboxylic acids and their derivatives (nomenclature, preparation and chemical properties)	1	2
Amines(nomenclature, preparation and chemical properties)	1	2
Inductive effect, resonance effect and stereochemistry	1	2

Laboratory Part:

I-Identification and investigation tests of the following

a. Alcohols

b. Aldehydes and ketones
c. Carboxylic acids
d. Salts of carboxylic acids

II-General scheme for identification of organic aliphatic unknown

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	-	42			70
Credit	2	-	1			3

3. Additional private study/learning hours expected for students per week. 4hr

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	**Course Teaching Strategies**	**Course Assessment Methods**
1.0	**Knowledge**		
1.1	Recognize the general IUPAC rules for nomenclature of different organic classes	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • long and short essays • posters lab manuals
1.2	Name different organic classes and organomettalic compounds using common and IUPAC system		
1.3	Know the classifications in different organic families		
1.4	Describe the different methods of preparations of organic compounds		
1.5	Familiar with the physical properties of different organic molecules and their relation with the structure		
1.6	Select the proper method of preparation of an organic molecule		
1.7	Identify the different conformations of alkanes and cycloalkanes		
1.8	Write a mechanism for a chemical organic transformation		
1.9	Determine the type of mechanism and intermediates in different organic reactions		
1.10	Recognize the industrial use of most famous organic molecules		
1.11	Memorize different name reactions in organic chemistry		
1.12	Outline the different uses of organometallic		

	compounds		
1.13	Define inductive and resonance effect		
2.0	**Cognitive Skills**		
2.1	Apply the IUPAC rules for all organic families	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • posters • demonstrations
2.2	Compare between IUPAC nomenclature and common nomenclature for organic compounds		
2.3	Explain the different strategies for preparation of organic compounds		
2.4	Analyze the reasons for the unique physical properties in some organic compounds		
2.5	Predict the most stable conformation of alkanes and cycloalkanes		
2.6	Summarize the different reactions of organic compounds		
2.7	Account for the acidity and basicity of different organic compounds		
3.0	**Interpersonal Skills & Responsibility**		
• Ability to work in a team to perform a specific experimental tasks. • Ability to work independently to handle chemicals • Ability to communicate results of work to classmate and participation in class or laboratory discussions		• Class discussions • Research activities	• Performance on in-practical exams. • Work on research activity. • Overall student performance in Lab. discussions • Cross questions after finishing laboratory work
4.0	**Communication, Information Technology, Numerical**		
• Evaluate the different methods of preparation of organic compounds • Demonstrate a synthetic pathways for synthesis of organic molecules • Enhancing the ability of students to use computers and internet. • Interpret chemical data • Present chemical data orally. • Know how to write a report.		• Lectures • Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
5.0	**Psychomotor**		

	Laboratory practice . including 1.Locate Materials Safety Data Sheets, chemicals carcinogens list, and hazardous chemicals list. 2. Handle chemicals safely with a proper PPE 3.Dilute solutions, repeat analysis and calculate true result for all procedures performed as required. 4. Dispose the hazardous solution in right way	Practical session should include both demonstration and experiments .	1.Repetition of the experiments , to reproduce the results 2.Written report of chart and procedures. 3.The students should be able to correlate their results with experimental conditions

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	Midterm Exam.	8	20 %
3	Practical Exam.	14	30 %
4	Final Exam.(2 hours exam)	16	40 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

- T. W. Graham Solomons, Craig B. Fryhle, Scott A. Snyder "*Organic Chemistry, 11th Edition, International Student Version*" **2013**, John Wiley & Sons.
- John McMurry's "*Organic Chemistry, 8th edition, International Edition*" **2011**, Brooks/Cole
-

2. List Essential References Materials (Journals, Reports, etc.)

- Lecture Hand outs available on the coordinator website

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

- Amit Arora "*Introductory Organic Chemistry*" **2006**, Discovery Publishing House New Delhi
- M. Casey, J. Leonard, B. Lygo, G. Procter "*Advanced Practical Organic Chemistry*" 1990, Springer US

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com**
- **http://www.sciencedirect.com**
- **http://www.rsc.org**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- **Classrooms capacity (30) students.**
- **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

- **Room equipped with computer and projector and TV.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching
Complete the questionnaire evaluation of the course in particular.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- **Observations and the assistance of colleagues.**
- **Independent evaluation for extent to achieve students the standards.**
- **Iindependent advice of the duties and tasks.**

3 Processes for Improvement of Teaching

- **Workshops for teaching methods.**
- **Continuous training of member staff.**
- **Review of strategies proposed.**
- **Providing new tools for learning.**
- **The application of e-learning.**
- **Eexchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: **Professor Mohamed R. Shaaban**

Signature: **Date Report Completed: 2018**

Received by: Dr. Ismail Althagafi **Department Head**

Signature: ______________________________ **Date: ______________**

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Chemistry of Aromatic Compounds

4022142-3
Course Specifications
(CS)

Course Specifications

Institution: **Umm Al-Qura University** Date of Report:

College/Department : **Faculty of Applied Science/ department of chemistry**

A. Course Identification and General Information

1. Course title and code: **Chemistry of Aromatic Compounds /4022142-3**
2. Credit hours: **3 hrs (2 theoretical + 1 practical)**
3. Program(s) in which the course is offered. **Chemistry program**
4. Name of faculty member responsible for the course: **Dr. Heba Abd Elhady Mohamed**
5. Level/year at which this course is offered: **4rd level / 2st year**
6. Pre-requisites for this course (if any): **-Chemistry of Aliphatic Compounds**
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **both on El-Abdyah and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. **Traditional classroom** ■ What percentage? **100%**

b. Blended (traditional and online) ☐ What percentage?

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage? ☐

Comments:

B Objectives

1. What is the main purpose for this course?

By the end of this course student will be familiar with basic concepts in aromatic chemistry including dividing, naming, preparation, physical and chemical properties.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

- simulating evolution in the science of chemistry by trying to add new items on some points of the course
- diversify of learning sources for the course to benefit from more than one reference
- comparison of contents with that introduced in deferent local and international departments
- use of smart classes for lectures
- Encouragement of students to make reports in aromatic chemistry from libraries or by using internet (Self-study)

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
1. Aromaticity: Huckelrule and annulenes 2. Benzene: molecular orbital theory point of view, stability and resonance	1	2
3. Chemical properties of benzene: friedel-crafts reactions and their applications in organic syntheses	1	2
4. Electrophilic substitution reactions	1	2
5. Reactivity and orientation in benzene ring – second electrophilic substitution	1	2
6. Reactivity and orientation in benzene alkyl derivatives	2	4
7. Aromatic amines and their derivatives.	1	2
8. Sulfonic acids and their derivatives.	1	2
9. Phenols and their derivatives.	1	2
10. Aromatic aldehydes and ketones.	2	2
11. Aromatic carboxylic acids and their derivatives.	1	2
12. Poly nuclear aromatic hydrocarbons – diphenyl benzedene derivatives.	1	2
13. Condensed aromatic hydrocarbons - Cancer-causing hydrocarbons.	2	4

Laboratory Part:

I- Investigation and identification of the following

a. Aromatic hydrocarbons
b. Aromatic amines

c. Phenols
d. Aromatic aldehydes and ketones
e. Aromatic carboxylic acids
f. Sulfonic acids

II-General scheme for identification of organic aromatic unknown

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	-		42		70
Credit	2	-		1		3

3. Additional private study/learning hours expected for students per week.
Two hours for preparing and discussion of reports and solving home works in addition to the main time of lectures

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	**Course Teaching Strategies**	**Course Assessment Methods**
1.0	**Knowledge**		
1.1	Define aromatic compounds and aromaticity	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • long and short essays • providing various posters
1.2	Name different organic classes using common and IUPAC system		
1.3	classify different aromatic families		
1.4	Describe the different methods of preparations of aromatic compounds		
1.5	Familiar with the physical properties of different aromatic compounds and their relation with the structure		
1.6	Select the proper method of conversions among different aromatic compounds		
	Recognize the chemical properties of aromatic compounds		
1.7	Write a mechanism of electrophilic aromatic substitution reactions.		
1.8	Explain the products of different aromatic reactions		
1.9	Recognize the industrial use of most famous organic molecules		
2.0	**Cognitive Skills**		

2.1	Train to choose the suitable method for the preparation of aromatic compounds		
2.2	Apply the IUPAC rules for all aromatic families	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • posters • demonstrations
2.3	Choose the suitable mechanism for reactions		
2.4	Explain the different strategies for preparation of aromatic compounds		
2.5	Analyze the reasons for the unique physical properties in some organic compounds		
2.6	Predict the expected product in different aromatic reactions according to the functional group		
2.7	Summarize the different reactions of aromatic compounds		
3.0	**Interpersonal Skills & Responsibility**		
	Have the following skills • Ability to work in a team to perform a specific experimental tasks. • Ability to work independently to handle chemicals • Ability to communicate results of work to classmate and participation in class or laboratory discussions	• Class discussions • Research activities	• Performance on in-practical exams. • Work on research activity. • Overall student performance in Lab. discussions • Cross questions after finishing laboratory work
4.0	**Communication, Information Technology, Numerical**		
	• Research using computer to collect the data used in writing reports • Illustrate sources of new researches which are related to the course by researching in the internet • Able to calculate and discuss the facts and logical propose methods to solve the difficulties. • Ability to work in a team to perform a specific task.	• Using computers lab • Research centers visit • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
5.0	**Psychomotor** NOT APPLICABLE		
	Laboratory practice . including 1.Locate Materials Safety Data Sheets, chemicals carcinogens list, and hazardous chemicals list. 2. Handle chemicals safely with a proper PPE 3.Dilute solutions, repeat analysis and calculate true result for all procedures performed as required. 4.Dispose the hazardous solution in right way	Practical session should include both demonstration and experiments .	1.Repetition of the experiments , to reproduce the results 2.Written report of chart and procedures. 3.The students should be able to correlate their results with experimental conditions

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homeworks and activities.	All the term	10 %
2	Midterm Exam.	8 or 9	20 % **(Exam time is 60 minute)**
3	Activity in lab and practical Exam	All the term and the final exam at the 15th week	30 % **(Exam time is 180 minute)**
4	Final Exam.(2 hours exam)	16	40 % **% (Exam time is 120 minute)**
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

- John McMurry's "*Organic Chemistry, 8th edition, International Edition*" **2011**, Brooks/Cole

2. List Essential References Materials.

1. Amit Arora "*Introductory Organic Chemistry*" **2006**, Discovery Publishing House New Delhi
2. John McMurry's "*Organic Chemistry, 8th edition, International Edition*" **2011**, Brooks/Cole
3. T. W. Graham Solomons, Craig B. Fryhle, Scott A. Snyder "*Organic Chemistry, 11th Edition, International Student Version*" **2013**, John Wiley & Sons.

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com**
- **http://www.sciencedirect.com**
- **http://www.rsc.org**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)
   - **Classrooms capacity (30) students.**
   - **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

   - **Room equipped with computer and projector and TV.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)
   - **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

Complete the questionnaire evaluation of the course in particular.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- **Observations and the assistance of colleagues.**
- **Independent evaluation for extent to achieve students the standards.**
- **Independent advice of the duties and tasks.**

3 Processes for Improvement of Teaching

- **Workshops for teaching methods.**
- **Continuous training of member staff.**
- **Review of strategies proposed.**
- **Providing new tools for learning.**
- **The application of e-learning.**

- **Eexchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: **Organic Chemistry Staff Members**
Coordinator Dr. Heba Abd Elhady Mohamed

Signature: **Date Report Completed: 2015**

Received by: Dr. Ismail Althagafi **Department Head**

Signature: ________________________________ **Date: ________________**

Course Specifications

Physical Organic Chemistry

4023551-3

2016

Course Specifications

Institution Umm Al-Qura University.	Date of Report 13/3/2016
College/Department: Faculty of Applied Science - Department of Chemistry.	

A. Course Identification and General Information

1. Course title and code: Physical organic chemistry/ **4023551-3**
2. Credit hours: 3 hrs (theoretical).
3. Program(s) in which the course is offered: Chemistry
(If general elective available in many programs indicate this rather than list programs)
4. Name of faculty member responsible for the course: **Prof. Dr. Thoraya A. Farghaly**
5. Level/year at which this course is offered: 4/2.
6. Pre-requisites for this course (if any): Aromatic Chemistry
7. Co-requisites for this course (if any)
8. Location if not on main campus: **both on El-Abdyah and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom	√	What percentage?	%100
b. Blended (traditional and online)	☐	What percentage?	☐
c. e-learning	☐	What percentage?	☐
d. Correspondence	☐	What percentage?	☐
f. Other	☐	What percentage?	☐

Comments:

B Objectives

1. What is the main purpose for this course? A full knowledge of the basic concepts of physical organic chemistry including the mechanism of chemical reactions. Study the stereochemistry in different reaction types is also involved and chirality.
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) • Using smart classes for teaching in lectures. • The students will be encouraged to prepare an essay or a report from literature by using the library, data base services, and/or internet to follow up and update the new topics of the physical organic chemistry and stereochemistry course.

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
▪ Thermodynamic parameters affected the reactions. ▪ Reaction kinetic and determination of the reaction orders. ▪ Determination of reaction mechanism by physical and chemical properties.	2	6
▪ Factors affecting the distribution of electrons in molecules: (Inductive effect- Mesomeric effect- Steric effect).	1	3
▪ Nucleophilic substitution reaction SN^1 and SN^2.	2	6

▪ Elimination reactions E1 and E2.		3
▪ Exam 1		
▪ Electrophilic addition to carbon-carbon double bond. ▪ Nucleophilic addition to carbonyl group.	1	3
▪ Free radicals reactions.	1	3
▪ Solvent effect on chemical reactions. ▪ The chemistry of the reactive intermediate such as carboanion, carbocation, carbens and free radicals.	1	3
▪ Introduction to stereochemistry: Isomerism - Configuration - shape and types of isomerism: structural and conformational.	1	3
▪ conformational isomerism, Geometrical isomerism, Optical isomerism	2	6
▪ Chiral study and their properties.	1	3
• Compounds that contain more than one chiral carbon atom - Diastercomers and their properties.	1	3
• Revision	1	3
• Exam 2		

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	42	-	-	-	-	42
Credit	3					3

3. Additional private study/learning hours expected for students per week. - ☐

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	**Course Teaching Strategies**	**Course Assessment Methods**
1.0	**Knowledge**		
	1- Memorize of the basic rules in organic chemistry. 2- Understand of the division of types of electronic effects of groups in molecules. 3- Knowledge and understanding of the mechanism of different types of organic reactions. 4- Understand SN1 and SN2 Mechanisms. 5- Knowledge of types of isomerism. 6- Draw a shape of open and cyclic compounds. 7- Understand of the absolute configuration. 8- Knowledge of Diastercomers and their properties and Molecular Chirality.	1-Using open discussion to link the previous knowledge to the current and future topics. 2-The students use the internet to prepare an essay about a recent advances related to the course of physical organic chemistry and stereochemistry.	• Homework . • Oral discussion. • Assignments.

2.0	**Cognitive Skills**		
	o To acquire skills to different types of electronic effects in molecules. o To acquire skills to know the path of interaction and then find out mechanism. o Developing skills of drawing shape of the stereochemistry of organic compounds. o Understanding of the different types of isomerism.	• Using brain storming at the beginning of each lecture in order to stimulate the students towards the new topic of the course. • Enhancing open discussion during the lecture	• Assignments • Homework
3.0	**Interpersonal Skills & Responsibility**		
	➢ Divide the student in to teams to perform some joint reports. ➢ The development of the student to accepts the opinion of his colleague in his participation to perform an active presentation for the topic related to the course, and evaluate the results to find out the response of students for the collective cooperation.	• Encourage the solving problems in groups during lecture. • Making open discussion about certain recent topic of the course.	Homework and group reports.

4.0	**Communication, Information Technology, Numerical**		
	• Communicate effectively in oral and written forms. • Using information and communication technologies. • Using basic mathematical and statistical techniques.	❖ Using computer lab. ❖ Visiting the Central Library. ❖ Using international information network.	o Ask questions in the tests to explanation for simple statistical information. o Assessing the duties associated with suitable use of communication skills and numerical.
5.0	**Psychomotor**		
	Non-requirement in the curriculum**.**	Non-requirement in the curriculum**.**	Non-requirement in the curriculum**.**

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	First Periodic Exam.	6	20 %
3	Second Periodic Exam.	12	20 %
4	Final Exam.(2 hours exam)	16	50 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- We have faculty members to provide counseling and advice.
- Office hours: During the working hours weekly.
- Academic Advising for students.

E. Learning Resources

1. List Required Textbooks

1- "Modern Physical Organic Chemistry" Eric V. Anslyn, Texas, Austin Dennis A. Dougherty, University Science Books Sausalito, California, 2005.
2-Howard Maskill "*Structure and Reactivity in Organic Chemistry, Volume 81 of Oxford Chemistry Primers*" 1999, OUP Oxford.

2. List Essential References Materials (Journals, Reports, etc.)

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

1. John McMurry's "*Organic Chemistry, 8th edition, International Edition*" 2011, Brooks/Cole.

2. T. W. Graham Solomons, Craig B. Fryhle, Scott A. Snyder "*Organic Chemistry, 11th Edition, International Student Version*" 2013, John Wiley & Sons.

3. R. K. Sharma "*Stereochemistry,Volume 4*" **2008**, Discovery Publishing House.
4. Michael J. T. Robinson "*Organic Stereochemistry*" **2000**, OUP Oxford.

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- http://www.chemweb.com
- http://www.sciencedirect.com
- http://www.rsc.org

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

- Microsoft PowerPoint, Microsoft Word, Microsoft Excel.
- Videos on physical organic chemistry.
- CD for learning physical organic chemistry.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

   - Classrooms capacity (30) students.
   - Providing hall of teaching aids including computers and projector.

2. Computing resources (AV, data show, Smart Board, software, etc.)

   - Room equipped with computer and projector and TV.

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

   No other requirements.

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- ➢ Complete the questionnaire evaluation of the course in particular.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- ✓ Observations and the assistance of colleagues.
- ✓ Independent evaluation for extent to achieve students the standards.
- ✓ Iindependent advice of the duties and tasks.

3 Processes for Improvement of Teaching

- Workshops for teaching methods.
- Continuous training of member staff.
- Review of strategies proposed.
- Providing new tools for learning.
- The application of e-learning.
- Eexchange of experiences internal and external.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- Check marking of a sample of exam papers, or student work.
- Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- ❖ Periodic Review of the contents of the syllabus and modify the negatives.
- ❖ Consult other staff of the course.
- ❖ Hosting a visiting staff to evaluate of the course.
- ❖ Workshops for teachers of the course.

Faculty or Teaching Staff: **Prof. Thoraya A. Farghaly**

Signature: ______________________________ **Date Report Completed: 2018**

Received by: Dr. Ismail Althagafi **Dean/Department Head**

Signature: ______________________________ **Date:** _______________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Heterocyclic Chemistry

4023556-3

Course Specifications
(CS)

Course Specifications

Institution: **Umm Al-Qura University**	Date of Report: **2018**
College/Department : **Faculty of Applied Science/ Department of Chemistry**	

A. Course Identification and General Information

1. Course title and code: **Heterocyclic Chemistry /4023556-3**
2. Credit hours: **3 hrs (2 theoretical + 1 practical)**
3. Program(s) in which the course is offered: **Chemistry program**
4. Name of faculty member responsible for the course: **Dr. Rasha El-Demerdashi El-Mekawi**
5. Level/year at which this course is offered: **5th level/3 year (1st term)**
6. Pre-requisites for this course (if any): **Chemistry of aromatic compounds (4022142-3)**
7. Co-requisites for this course (if any): **Chemistry of Organic Reactions and Preparation (4023565-3)**
8. Location if not on main campus: **both on El-Abdyah and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom	☐	What percentage?	☐
b. Blended (traditional and online)	☒	What percentage?	**90** %
c. e-learning	☒	What percentage?	**10** %
d. Correspondence	☐	What percentage?	☐
f. Other	☐	What percentage?	☐

Comments:

B Objectives

1. What is the main purpose for this course? ☒ **By the end of this course student will be familiar with Studying trivial and systematic nomenclature, chemical properties and synthesis of different heterocyclic compounds**.
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field ☒ **The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course**

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
a- Classification of heterocyclic compounds	1	2
b- Nomenclature of monocyclic heterocyclic compounds as well as fused systems	2	4
c- Bonding, Structure and geometry in heterocyclic compounds: three, four, five and six membered heterocycles- Aromaticity – Basicity	2	4
d- Structure and reactivity of different heterocycles five and six-membered rings with one or more different heteroatoms (same or different heteroatoms).	2	4
e- Chemical reactions of different heterocyclic compounds five and six-membered rings with one or more different heteroatoms (same or different heteroatoms).	2	4
f- Cycloaddition reactions (Diels-Alder [2+4]) of different heterocyclic compounds five and six-membered rings with one or more different heteroatoms (same or different heteroatoms).	1	2

g- Synthetic Routes to five membered rings with one or more different heteroatoms (same or different heteroatoms).	1	2
h- Synthetic Routes to six membered rings and fused heterocyles with one heteroatom.	1	2
i- Synthetic Routes to six membered rings with two heteroatoms (Diazines) (pyrimidine and pyrazine)	1	2

Laboratory Part:

1- Identifying the protocol of security and safety in lab. and developing of the environmental awareness
2- Synthesis of phthalimide
3- Synthesis of phthalaylglycine
4- Synthesis of benzimidazole
5- Synthesis of benzotriazole
6- Synthesis of 1, 2, 3, 4-tetrahydrocarbazole
7- Synthesis of 3-methyl-1-phenyl-5-pyrazolone
8- Synthesis of 7-hydroxy-4-methyl coumarin
9- Synthesis of 3, 4-dihydro-1-hydroxy-4-oxo phthalazine
10- Synthesis of 4-benzylidene-2-methyloxyazol-5-one
11- Synthesis of 5, 5-diphenyl hydantoin
12- Synthesis of 2, 4, 5-triphenyl oxazole

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	26	-	36			62
Credit	2	-	1			3

3. Additional private study/learning hours expected for students per week. 2hr

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	**Course Teaching**	**Course Assessment**

		Strategies	Methods
1.0	**Knowledge**		
1.1	Studying the molecular structures of different heterocyclic compounds	• Lectures • Scientific discussion • Library visits • Web-based study • E-learning	• Exams • web-based student performance systems • portfolios • long and short essays • posters lab manuals • Homework • Periodic Short exams
1.2	Describing the classification of heterocyclic compounds according to their different types		
1.3	Knowledge of different methods for nomenclature of heterocyclic compounds		
1.4	Showing the multiple methods of preparation of heterocyclic compounds		
1.5	Recognizing the chemical properties of heterocyclic compounds		
1.6	Identifying the chemical reactions of different heterocyclic compounds		
2.0	**Cognitive Skills**		
2.1	Development of reverse thinking skill (back thinking) and the student's acquiring the training skill to choose the suitable method for heterocyclic compounds preparation	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • posters • demonstrations
2.2	Making the student acquire the skill of naming heterocyclic compounds		
2.3	The studen't acquiring of the skill of how to predict the outcomes of interactions of heterocyclic compounds		
2.4	The student can pick the appropriate methods for the preparation of heterocyclic compounds		
2.5	Design of different ways to nomenclature the heterocyclic compounds		
2.6	Student invents different ideas for the construction of many of the heterocyclic compounds		
2.7	The student is planning to make a research programme in the field of chemistry of heterocyclic compounds and their effectiveness		
3.0	**Interpersonal Skills & Responsibility**		
	• Ability to work in a team to perform a specificexperimental tasks. • Ability to work independently to handle chemicals • Ability to communicate results of work to classmate and participation in class or laboratory discussions	• Class discussions • Research activities	• Performance on in-practical exams. • Work on research activity.

			• Overall student performance in Lab. discussions • Cross questions after finishing laboratory work
4.0	**Communication, Information Technology, Numerical**		
4.1	The ability to conduct a successful style of dealing with data analysis, describing his strategy in the image and draw conclusions from them	• Lectures • Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
4.2	Introductory lecture at the beginning of the semester to use the computer and the internet to search for sources of new researches and collect the researches which help in writing reports on topics related to syllabus.		
4.3	Evaluating the performance of the students through examination, duties and the discussion in the lecture which constitute 30 % of the total evaluation.		
5.0	**Psychomotor**		
	Not Applicable		

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	**Midterm Exam**	**5-14**	**20%**
2	**Assignments (Homework + Activities+ Attendance +periodic short exams)**		**10 %**
3	**Practical Exam**	**15**	**30%**

4	Final Exam.(2 hours exam)	**16**	**40%**
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

- Eric Scriven, Christopher A. Ramsden "Advances in heterocyclic chemistry" 1st Ed., published: 1st June, Vol. 126, 2018. **Hardcover ISBN:** 9780128152096, **Imprint:** Academic Press. Elsevier
- Eric Scriven, Christopher A. Ramsden "Advances in heterocyclic chemistry" 1st Ed., published: 3rd February, Vol. 125, 2018. **ardcover ISBN:** 9780128152102, **Imprint:** Academic Press. Elsevier.
- Eric Scriven, Christopher A. Ramsden "Advances in heterocyclic chemistry" 1st Ed., published: 4th January, Vol. 124, 2018. **E-Book ISBN:** 9780128137611, **Hardcover ISBN:** 9780128137604, **Imprint:** Academic Press, Elsevier
- Gordon Gribble, John Joule "Progress in heterocyclic Chemistry" 1st Ed., Published: 5th September, Vol. 29, 2017. **E-Book ISBN:** 9780081023112, **Hardcover ISBN:** 9780081023105, **Imprint:** Elsevier
- Alan R. Katritzky, Christopher A. Ramsden, John A. Joule " Advances in heterocyclic Chemistry" 1st Ed., Published 7 Novmber, Vol. 113, 2014. **ISBN** 10 0080958435, **ISBN** 13 9780080958439, **Imprint**: Elsevier / The Lancet

2. List Essential References Materials (Journals, Reports, etc.)

- Lecture Hand outs available on the coordinator website

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

- Eric Scriven, Christopher A. Ramsden "Advances in heterocyclic chemistry" 1st Ed., published: 4th April, Vol. 123, 2017. **E-Book ISBN:** 9780128121955, **Hardcover ISBN:** 9780128120927, **Imprint:** Academic Press, Elsevier.
- Eric Scriven, Christopher A. Ramsden "Advances in heterocyclic chemistry" 1st Ed, published: 25th March, Vol. 122, 2017. **E-Book ISBN:** 9780128119938, **Hardcover ISBN:** 9780128119730, **Imprint:** Academic Press Elsevier.
- Eric Scriven, Christopher A. Ramsden " Heterocyclic Chemistry in the 21st century: A Tribute to Alan R. Katritzky" 1st Ed., Published: 4th January Vol. 121, 2017. **E-Book ISBN:** 9780128120705, **Hardcover ISBN:** 9780128111741, **Imprint:** Academic Press
- Gordon Gribble, John Joule "Progress in heterocyclic Chemistry" 1st Ed., Published: 3rd September, Vol. 28, 2016. **E-Book ISBN:** 9780080994093, **Hardcover ISBN:** 9780080994062, **Imprint:** Elsevier

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com**
- **http://www.sciencedirect.com**
- **http://www.rsc.org**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- **Classrooms capacity (30) students.**
- **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

- **Room equipped with computer and projector and TV.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching
Complete the questionnaire evaluation of the course in particular.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- **Observations and the assistance of colleagues.**
- **Independent evaluation for extent to achieve students the standards.**
- **Iindependent advice of the duties and tasks.**

3 Processes for Improvement of Teaching

- **Workshops for teaching methods.**
- **Continuous training of member staff.**
- **Review of strategies proposed.**
- **Providing new tools for learning.**
- **The application of e-learning.**
- **Eexchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: **Dr/ Rasha El-Mekawy**

Signature: Rasha **Date Report Completed: 2018**

Received by: Dr Ismail I. Althagafi **Department Head**

Signature: ________________________________ Date: _______________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Organic Spectroscopy

4023561-3
Course Specifications
(CS)

Course Specifications

Institution: **Umm Al-qura University**	Date of Report: **2017**
College/Department : **Faculty of Applied Science/ department of chemistry**	

A. Course Identification and General Information

1. Course title and code: **Organic Spectroscopy** / **4023561-3**
2. Credit hours: **3 hrs (2 theoretical + 1** Tutorial**)**
3. Program(s) in which the course is offered. **Chemistry**
4. Name of faculty member responsible for the course: **Dr.Hossa fahad alshareef**
5. Level/year at which this course is offered: **5th level/3rd year**
6. Pre-requisites for this course (if any): **Physical Organic Chemistry and Stereochemistry**
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **both on El-Abdyah and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ☒ What percentage? **100%**

b. Blended (traditional and online) What percentage?

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage? ☐

Comments:

B Objectives

1. What is the main purpose for this course? **By the end of this course student will be familiar with compounds analysis by (UV-Spectroscopy , Infra-Red Spectroscopy ,NMR-Spectroscopy,Mass Spectroscopy)**
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) **The students will be training to using data base services, and/or websites to improving interpretation of compounds with spectroscopy**

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact Hours
1- Principals of spectroscopy and index of hydrogen deficiency.	**1**	**2**
2- UV Spectroscopy: ground and excited states, molar absorptivity, an calculation of A max to the possible structure.	**2**	**4**
3- Applications and solving problems.	**1**	**2**
4- Factors affecting absorption frequency, experimental aspects of IR spectroscopy.	**1**	**2**
5- Interpretation of IR charts.	**1**	**2**
6- The nature of NMR absorption instrumentation; chemical shifts in 1H NMR spectroscopy.	**1**	**2**
7- Shielding and de shielding effect magnetic anisotropy, spin-spin coupling in 1H NMR spectroscopy.	**2**	**4**
8- ^{13}C NMR spectroscopy (chemical shift);more complex spin-spin splitting patterns.	**1**	**2**
9- Mass Spectrometry (MS): ionization process and instrumentation.	**1**	**2**
10- Examples of common types of fragmentation processes.	**1**	**2**
11- Applications and solving problems.	**1**	**2**
12- Apply all Spectra.	**1**	**2**

Tutorial Part:

1- interpretation and confirmation of compounds of the following

- **a. interpretation of IR charts**
- **b. interpretation of ^{1}H NMR chart**
- **c. interpretation of ^{13}C NMR chart**
- **d. interpretation of Mass(MS) chart**

2- applications and solving problems contain all spectra.

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	**28**	**42**	**----**	**----**	**----**	**70**
Credit	**2**	**1**	**----**	**----**	**----**	**3**

3. Additional private study/learning hours expected for students per week. 4hr

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	**Course Teaching Strategies**	**Course Assessment Methods**
1.0	**Knowledge**		
1.1	Recognize the general Principals of different spectroscopy.	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • long and short essays • posters • lab manuals
1.2	Know position the functional groups in infra red		
1.3	Describe the compounds with spectroscopy		
1.4	Familiar with the factors affecting absorption frequency		
1.5	Determine the type and numbers of signals for NMR spectra in the different compounds		
1.6	Identify the examples of common types of fragmentation processes		
2.0	**Cognitive Skills**		
2.1	Apply the spectroscopy steps for all compounds .	• Scientific discussion	• Exams • web-based student performance systems
2.2	Predict the structure of compounds with study spectroscopy		

2.3	Compare between methods spectroscopy .	• Library visits • Web-based study	• portfolios • posters • individual and group presentations • video analsis • lap manuals
2.4	Explain the different Benefits for study organic spectroscopy		
2.5	Summarize the spectroscopy of organic compounds		
2.6	development Reverse thinking skill (back thinking)		
3.0	**Interpersonal Skills & Responsibility**		
	• Use the spectroscopy for Discovers the structure of compound . • justify the structure of compound according to spectroscopy • Ability to communicate results of work to classmates. • Ability to work in a team to perform a specific task.	• Library visits • Scientific discussion • Web-based study	• web-based student performance systems • individual and group presentations
4.0	**Communication, Information Technology, Numerical**		
	• Demonstrate structure for organic compounds with spectroscopy • Use information and communication technology. • The ability to use e-mail to communicate with the instructor and other students. • Scientific writing. • Use his/her observations to solve problems.	• Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
5.0	**Psychomotor**		
5.1	NOT APPLICABLE		
5.2			

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	Midterm Exam.	8	20 %
3	Practical Exam.	14	30 %
4	Final Exam.(2 hours exam)	16	40 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

- Pavia, D.; Lampman, G.M.; Kriz, G.S.; Vyvyan, J.R. Introduction to Spectroscopy, 4 th edition, 2009, Belmont : Brooks/Cole, Cengage Learning.
- Silverstein, R.M.; Webster, F.X.; Kiemle, D.J. Spectrometric Identification of Organic Compounds. 7th edition, 2005, N.Y. : John Wiley & Sons, Inc.
- Prof.Dr.AbdullahM.Asiri,MahaM.Al-Otaibi"*Spectroscopic Methods in Organic Chemistry, 1st Edition*, 2012.

2. List Essential References Materials (Journals, Reports, etc.)

Prof.Dr.Abdullah M.Asiri,Dr.Abood Bahajaj " *Principles of Spectroscopic Analysis of Organic Compounds*"

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

- R.T.Morrison ,R.N.Boyd,S.K.Bhattacharjee " *Organic Chemistry*" 7th**2011**,

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com**
- **http://www.sciencedirect.com**
- **http://www.rsc.org**
- http://stream.hebust.edu.

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- **Classrooms capacity (30) students.**
- **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

- **Room equipped with computer and projector and TV.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching
Complete the questionnaire evaluation of the course in particular.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- **Observations and the assistance of colleagues.**
- **Independent evaluation for extent to achieve students the standards.**
- **Iindependent advice of the duties and tasks.**

3 Processes for Improvement of Teaching

- **Workshops for teaching methods.**
- **Continuous training of member staff.**
- **Review of strategies proposed.**
- **Providing new tools for learning.**
- **The application of e-learning.**
- **Eexchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: Dr.Hossa fahad alshareef

Signature: **Date Report Completed: 2018**

Received by: Dr Ismail I. Althagafi Department Head

Signature: ________________________________ Date: _______________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Organic Reactions and Preparations

4023565-3
Course Specifications
(CS)

Course Specifications

Institution: **Umm Al-qura University**	Date of Report: **2016**
College/Department : **Faculty of Applied Science/ Department of chemistry**	

A. Course Identification and General Information

1. Course title and code: **Organic Reactions and Preparations/ 4023565-3**
2. Credit hours: **3 hrs (2 theoretical + 1 practical)**
3. Program(s) in which the course is offered. **Chemistry program**
4. Name of faculty member responsible for the course: **Dr. Essam M. Hussein**
5. Level/year at which this course is offered: **6st level / 3th year**
6. Pre-requisites for this course (if any): **Heterocyclic Chemistry**
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **both on El-Abdyah and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ☒ What percentage? **100%**

b**. Blended (traditional and online)** ☐ What percentage?

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage? ☐

Comments:

B Objectives

1. What is the main purpose for this course?

The course is designed to theoretical and practical study of the different reactions to synthesis of different classes of organic compounds.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
a. Introduction to organic synthesis	**1**	**2**
b. Chemistry of functional groups: carbonyl compounds, carboxylic acids/their derivatives, amines, nitriles, and sulfides/sulfoxides.	**2**	**4**
c. Named reactions: Aldol condensation - Claisen condensation – Claisen rearrangement - Friedel–Crafts acylation – Grignard reaction –Michael reaction – Wittig reaction – Suzuki coupling – Diels-Alder reaction.	**2**	**4**
d. Protection and deprotection of function groups: Hydroxyl group, carbonyl group, carboxylic group, and amino group	**1**	**2**
e. Redox reactions and selectivity	**1**	**2**
f. C-C bond formation: free radicals, enolates, coupling reaction	**2**	**4**
g. Pericyclic reactions	**2**	**4**
h. Retrosynthetic approach	**2**	**4**
i. Chemoselectivity	**1**	**2**

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	**28**	**---**	**42**	**---**	**---**	**70**
Credit	**2**	**---**	**1**	**---**	**---**	**3**

3. Additional private study/learning hours expected for students per week. 2hr

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	**Course Teaching Strategies**	**Course Assessment Methods**
1.0	**Knowledge**		
1.1	Identify the different classes of organic compounds depending on the functional groups	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • long and short essays • posters lab manuals
1.2	Recognize the different methods used in the preparation of various organic compounds		
1.3	Write the products of chemical reaction correctly		
1.4	Determine the type of mechanism and intermediates in different organic reactions		
1.5	Familiar with the basic knowledge about the properties and importance of various organic compounds and reagents		
1.6	Understand the rules of retrosynthetic approach		
1.7	Understand the meaning of chemoselectivity		
1.8	Know the different methods used in the preparation of various organic compounds		
2.0	**Cognitive Skills**		
2.1	Explain the outputs of organic chemical reactions	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • posters • demonstrations
2.2	Compare between different methods to synthesis different organic compounds		
2.3	Explain the reaction mechanisms for different organic reactions		
2.4	Predict the products of different organic reactions		
2.5	Design the different ways to prepare the functional groups of organic compounds		
2.6	Summarize the different methods of organic synthesis		

2.7	Apply the different laboratory techniques to purify the organic molecules		
3.0	**Interpersonal Skills & Responsibility**		
	• Ability to work in a team to perform a specific experimental tasks. • Ability to work independently to handle chemicals • Ability to communicate results of work to classmate and participation in class or laboratory discussions	• Class discussions • Research activities	• Performance on in-practical exams. • Work on research activity. • Overall student performance in Lab. discussions • Cross questions after finishing laboratory work
4.0	**Communication, Information Technology, Numerical**		
	• Evaluate the different methods of preparation of organic compounds • Demonstrate a synthetic pathways for synthesis of organic compounds • Use the internet as a means of communication and a source of information. • Encourage students to use internet for searching certain electronic journals regarding topics of the course. • Scientific writing. • Use his/her observations to solve problems. • Doing research and conduct searches for restoring information. • Able to calculate and discuss the facts and logical propose methods to solve the difficulties.	• Lectures • Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
5.0	**Psychomotor**		
	Laboratory practice . including 1.Locate Materials Safety Data Sheets, chemicals carcinogens list, and hazardous chemicals list. 2. Handle chemicals safely with a proper PPE 3.Dilute solutions, repeat analysis and calculate true result for all procedures performed as required. 4.Pipette accurately at all times 5. Titrate and weight efficiently in right way 6.Dispose the hazardous solution in right way	Practical session should include both demonstration and experiments .	1.Repetition of the experiments , to reproduce the results 2.Written report of chart and procedures. 3.The students should be able to correlate

			their results with experimental conditions

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	**--**	**10 %**
2	Midterm Exam.	**8**	**20 %**
3	Practical Exam.	**14**	**30 %**
4	Final Exam.(2 hours exam)	**16**	**40 %**
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

- T. W. Graham Solomons, Craig B. Fryhle, Scott A. Snyder "*Organic Chemistry, 11th Edition, International Student Version*" 2013, John Wiley & Sons.
- J. McMurry "*Organic Chemistry, 8th edition, International Edition*" 2011, Brooks/Cole

2. List Essential References Materials (Journals, Reports, etc.)

- Lecture Hand outs available on the coordinator website

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

- Stuart Warren, Paul Wyatt "*Organic Synthesis: The Disconnection Approach, 2nd Edition*" 2008, Wiley-Blackwell.

- P.G.M. Wuts "*Green's Protective Groups in Organic Synthsis*", 2007, Wiley.
- P. Wyatt and S. Warren "*Organic Synthesis: Strategy & Control*", 2007, Wiley.

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com**
- **http://www.sciencedirect.com**
- **http://www.rsc.org**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)
   - **Classrooms capacity (30) students.**
   - **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)
   - **Room equipped with computer and projector and TV.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)
   - **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching
Complete the questionnaire evaluation of the course in particular.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- **Observations and the assistance of colleagues.**
- **Independent evaluation for extent to achieve students the standards.**
- **Iindependent advice of the duties and tasks.**

3 Processes for Improvement of Teaching

- **Workshops for teaching methods.**
- **Continuous training of member staff.**
- **Review of strategies proposed.**

- **Providing new tools for learning.**
- **The application of e-learning.**
- **Eexchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: Dr. Essam M. Hussein

Signature: **Date Report Completed: 2018**

Received by: Dr Ismail I. Althagafi Department Head

Signature: _________________________________ Date: ________________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Chemistry of Natural Products

4024571-2
Course Specifications
(CS)

Course Specifications

Institution: **Umm Al-Qura University** Date of Report: **15/ 3/ 2016**

College/Department : **Faculty of Applied Science/ department of chemistry**

A. Course Identification and General Information

1. Course title and code: **Chemistry of Natural Products/ 4024571-2**
2. Credit hours: **2 hrs (theoretical)**
3. Program(s) in which the course is offered.
(If general elective available in many programs indicate this rather than list programs)
Chemistry program
4. Name of faculty member responsible for the course: **Dr. Essam M. Hussein**
5. Level/year at which this course is offered: **6th level / 3rd year**
6. Pre-requisites for this course (if any): **Heterocyclic Chemistry**
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **both on El-Abdyah, and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ☒ What percentage? **100%**

b**. Blended (traditional and online)** What percentage?

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage? ☐

Comments:

B Objectives

1. What is the main purpose for this course? **By the end of this course student will be familiar with nomenclature, structure elucidation, general properties and methods of preparation of natural products**
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) **The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course**

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
a. Definition, classification, nomenclature and Identification of natural products: Terpenoids – Steroids – Alkaloids	**2**	**4**
b. Terpenoids : Introduction and isolation from plants – general structure and nomenclature – classification – general methods of determination of the molecular structures and their preparations, for examples: (Acyclic monoterpenoids (myrcene)- Monocyclic monoterpenoids (limonene)- Bicyclicmonoterpenoids (camphor)- Sesquiterpenoids (farnesol)- Triterpenoids (squalene)- Tetraterpenoids (β-carotene).	**4**	**8**

c. Steroids : Introduction and their natural abundance – the difference between steroid compounds – nomenclature – structure elucidation of steroids – methods of preparation of steroids, for examples: Sterols (cholesterol) – Sex hormones (Estrogens (estraiol), Androgenes (testesterone) and Gestogenes (progesterone)- Bile acids (cholanic acid).	**4**	**8**
• Alkaloids : Introduction and methods of extractions – general properties – classification of alkaloids, structure elucidation of alkaloids and methods of their preparation, for examples: Phenyl methyl group (adrenaline)-Pyrrolidine group (hygrine)-Pyridine group (trigonelline)- Pyrrolidine and Pyridine group (nicotine)- Indole group (heptaphylline).	**4**	**8**

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	**28**	**-**	**-**	**-**	**-**	**28**
Credit	**2**	**-**	**-**	**-**	**-**	**2**

3. Additional private study/learning hours expected for students per week**.** **~ 4 Hours**

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		

1.1	Recognize the natural abundance of natural products	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • long and short essays • posters lab manuals
1.2	Name different natural products classes		
1.3	Know the methods of isolation from plants of natural products		
1.4	Describe the different methods of extraction of the natural products		
1.5	Familiar with the general properties of different natural products and their relation with the molecular structure		
1.6	Select the proper method of elucidation of structure of an natural products		
1.7	Identify the natural products		
1.8	Write a mechanism for a natural product transformation		
1.9	Recognize the importance of natural products and their impact on the human body		
1.10	Memorize different names of natural products with general structure		
1.11	Outline the different uses of natural products		
2.0	**Cognitive Skills**		
2.1	Compare each class of natural products through its structure	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • posters • demonstration • individual and group presentations • video analysis
2.2	Explain the different strategies for preparation of natural products		
2.3	Analyze the reasons for the unique properties in some natural products		
2.4	Predict the benefits and harms of various natural products		
2.5	Summarize the different methods for the preparation of various natural products		
3.0	**Interpersonal Skills & Responsibility**		
	• The division of students collectively for teams to make some common reports • Self-reliance and take individual responsibility and the ability to work within the group	• Scientific discussion • Web-based study	• web-based student performance systems
4.0	**Communication, Information Technology, Numerical**		
4.1	• Evaluate the different methods of preparation of		• web-based

4.2 4.3 4.4 4.5	natural products • Demonstrate a synthetic pathways for synthesis of natural products • The ability to conduct a successful style of dealing with data analysis, describing his strategy in the image and draw conclusions from them • use the computer and the internet to search for sources of new researches and collect the researches which help in writing reports on topics related to syllabus. • Interpret chemical data • Present chemical data orally. • Know how to write a report.	• Lectures • Scientific discussion • Library visits • Web-based study	student performance systems • individual and group presentations
5.0	**Psychomotor**		
5.1 5.2	NOT APPLICABLE		

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	**10 %**
2	First Periodic Exam.	**6**	**20 %**
3	Second Periodic Exam.	**12**	**20 %**
4	Final Exam.(2 hours exam)	**16**	**50 %**
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

- Raymond Cooper, George Nicola" *Natural Products Chemistry : Sources, Separations and Structures, 1st Edition*" 2014, CRC Press.
- Rensheng Xu, Yang Ye, Weimin Zhao" *Introduction to Natural Products Chemistry, 1st Edition*" 2011, CRC Press
- Sujata V. Bhat, B.A. Nagasampagi, Meenakshi Sivakumar "*Chemistry of natural products , 1st Edition*" 2005, Springer.

2. List Essential References Materials (Journals, Reports, etc.)

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

- P.M. Dewick "*Medicinal Natural Products: A Biosynthetic Approach*", 2nd Edition, Wiley & Sons, 2002 and 3rd Edition, Wiley & Sons, 2009.
- J. R. Hans Editor E. W. Abel "*Natural Products : The Secondary Metabolites*" Copyright: 2003.Print ISBN: 978-0-85404-490-0

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com**
- **http://www.sciencedirect.com**
- **http://www.rsc.org**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- **Classrooms capacity (30) students.**
- **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

- **Room equipped with computer and projector and TV.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach

list)

- **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

Complete the questionnaire evaluation of the course in particular.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- **Observations and the assistance of colleagues.**
- **Independent evaluation for extent to achieve students the standards.**
- **Iindependent advice of the duties and tasks.**

3 Processes for Improvement of Teaching

- **Workshops for teaching methods.**
- **Continuous training of member staff.**
- **Review of strategies proposed.**
- **Providing new tools for learning.**
- **The application of e-learning.**
- **Eexchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: **Dr. Essam M. Hussein**

Signature: **Date Report Completed: 2018**

Received by: Dr Ismail I. Althagafi **Department Head**

Signature: _________________________________ **Date: ________________**

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Polymer Chemistry

4024581-3
Course Specifications
(CS)

Course Specifications

Institution: **Umm Al-qura University** Date of Report: **2015**

College/Department : **Faculty of Applied Science/ department of chemistry**

A. Course Identification and General Information

1. Course title and code: **Polymer Chemistry 4024581-3**
2. Credit hours: **3 (2+1)**
3. Program(s) in which the course is offered. **Chemistry program**
4. Name of faculty member responsible for the course: **Dr. Essam M. Hussein**
5. Level/year at which this course is offered: **8st level / 4th year**
6. Pre-requisites for this course (if any): **Petroleum chemistry and Petrochemicals**
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **both on El-Abedyah, El-Azizya, and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ☒ What percentage? **100%**

b**. Blended (traditional and online)** What percentage?

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage? ☐

Comments:

B Objectives

1. What is the main purpose for this course?

This course aimed to study the preparation of polymers as well as understanding their physical and mechanical properties, applications, and its economic importance.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
a. Introduction and definitions	1	2
b. Basic principles of polymer classification – Polymer architecture – Types of polymers	1	2
c. Molecular weight of polymers	1	2
d. Condensation polymers - addition polymer	2	4
e. Mechanisms of polymerization reactions - copolymerization	1	2
f. Physical properties of polymers	2	4
g. Thermal transitions of polymers: glass transition state Tg – factors affecting on Tg	2	4
h. Polymer uses and future applications	2	4
i. Mechanical properties of polymers	1	2
j. Industrial synthesis of polymers and technology	1	2

Laboratory Part:

I- Synthesis of different polymeric copmpounds

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	-	42			70
Credit	2	-	1			3

3. Additional private study/learning hours expected for students per week. 2hr

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Identify the basic principles of polymer classification	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • long and short essays • posters lab manuals
1.2	identify different methods to determine the molecular weight of polymers		
1.3	Recognize the different methods used in the preparation of polymers		
1.4	Write the products of polymerization reaction correctly		
1.5	Recognize the different types of polymers		
1.6	Determine the type of mechanism of polymerization reactions		
1.7	Familiar with the basic knowledge about the thermal transitions of polymers		
1.8	Familiar with the basic knowledge about the importance and applications of polymers in industry		
1.9	Familiar with the mechanical properties of different polymers		
1.10			
2.0	**Cognitive Skills**		
2.1	Explain the physical properties of polymers	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • posters • demonstrations
2.2	Compare between the different methods of polymerization		
2.3	Explain the reaction mechanisms for different polymerization reactions		
2.4	Summarize the different methods used to synthesis of different types of polymers		
2.5	Explain the factors affecting glass transition state (Tg) of polymers		
2.6	Apply the different laboratory techniques to synthesis of polymer molecules		
2.7	Predict the future applications of polymers		
3.0	**Interpersonal Skills & Responsibility**		

	• Ability to work in a team to perform a specific experimental tasks. • Ability to work independently to handle chemicals • Ability to communicate results of work to classmate and participation in class or laboratory discussions	• Class discussions • Research activities	• Performance on in-practical exams. • Work on research activity. • Overall student performance in Lab. discussions • Cross questions after finishing laboratory work
4.0	**Communication, Information Technology, Numerical**		
	• Evaluate the different methods to synthesis of types of polymers • Enhancing the ability of students to use computers and internet. • Interpret chemical data • Present chemical data orally. • Know how to write a report. • Demonstrate a synthetic pathways for synthesis of polymer molecules • Demonstrate the different applications of polymers in industry	• Lectures • Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
5.0	**Psychomotor**		
5.1 5.2	Laboratory practice . including 1.Locate Materials Safety Data Sheets, chemicals carcinogens list, and hazardous chemicals list. 2. Handle chemicals safely with a proper PPE 3.Dilute solutions, repeat analysis and calculate true result for all procedures performed as required. 4.Pipette accurately at all times 5. Titrate and weight efficiently in right way 6.Dispose the hazardous solution in right way	Practical session should include both demonstration and experiments .	1.Repetition of the experiments , to reproduce the results 2.Written report of chart and procedures. 3.The students should be able to correlate their results with experimental conditions

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Exam	5-14	20%
2	Assignments		10%
3	Practical Exam	15	30%
4	Final Exam.(2 hours exam)	16	40%

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

- L. H. Sperling, *Introduction to Physical Polymer Science*, 4th Edition, Wiley, **2006**.
- I. M. Ward and J. Sweeney, *An Introduction to The Mechanical Properties of Solid Polymers*, 2nd Edition, Wiley, **2004**. (TA455.P58 W36 2004).
- Stanley R. Sandler, *Polymer Synthesis*, Vol. III, Academic Press, **1980.**
- Stanley R. Sandler, *Polymer Synthesis*, Vol. I, Academic Press, **1974.**

2. List Essential References Materials (Journals, Reports, etc.)

- Lecture Hand outs available on the coordinator website

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

1. John McMurry's "*Organic Chemistry, 8th edition, International Edition*" **2011**, Brooks/Cole.

-

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com** - **http://www.sciencedirect.com** - **http://www.rsc.org**
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) - **Classrooms capacity (30) students.** - **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.) ▪ **Room equipped with computer and projector and TV.**
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) - **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching Complete the questionnaire evaluation of the course in particular.
2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor - **Observations and the assistance of colleagues.** - **Independent evaluation for extent to achieve students the standards.** - **Iindependent advice of the duties and tasks.**
3 Processes for Improvement of Teaching - **Workshops for teaching methods.** - **Continuous training of member staff.** - **Review of strategies proposed.** - **Providing new tools for learning.** - **The application of e-learning.** - **Eexchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: Dr. Essam M. Hussein

Signature: **Date Report Completed: 2018**

Received by: Dr Ismail I. Althagafi Department Head

Signature: _______________________________ Date: _______________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Special Topics in Organic Chemistry

4024583-2

Course Specifications
(CS)

Course Specifications

Institution: **Umm Al-Qura University** Date of Report: **2015**

College/Department : **Faculty of Applied Science/ department of chemistry**

A. Course Identification and General Information

1. Course title and code: **Special topics in Organic chemistry/ 4024583-2**
2. Credit hours: **2 hrs (theoretical)**
3. Program(s) in which the course is offered. **Chemistry program**
4. Name of faculty member responsible for the course: **Prof. Dr. Thoraya A. Farghaly**
5. Level/year at which this course is offered: **8th level/4 year**
6. Pre-requisites for this course (if any): **Chemistry of Natural Products**
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **both on El-Abdyah, and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom	■	What percentage?	**100%**
b. Blended (traditional and online)		What percentage?	
c. e-learning	☐	What percentage?	☐
d. Correspondence	☐	What percentage?	☐
f. Other	☐	What percentage?	☐

Comments:

B Objectives

1. What is the main purpose for this course? **By the end of this course student will be familiar with the chemistry of carbohydrates, nucleic acids, amino acid, fats and oils. Also, provide basic understanding of the basic principles of photochemical reactions and to ensure that students gain basic knowledge in regards to photoenergy and solar energy conversion. The students will also learn about some of the main applications of photochemistry in research and industry**
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) • Out of class review sessions, reading assignments and homework that require using university online library will be considered to enrich the scope of the course. • The course material will be posted online so that it could be accessed by the students enrolled in the course. • Will utilize various internet resources that offer informative details and illustrative pictures, schemes, and videos to support the lecture course material.

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
a. Introduction to carbohydrate chemistry (classifications, different chemical structures of mono and disaccharides)	1	2
b. Reactions of carbohydrates, synthesis of Ascorbic acid, ascending and descending in sugar chain.	1	2
c. Nucleosides – Nucleotides –Nucleic Acids	1	2
d. Amino acid (protection of amino and carboxylic groups, Synthesis and reactions of amino acids	1	2
e. Proteins and peptides (chemical reactions, physical and chemical properties and different methods for their chemical configurations)	1	2
f. Fats and oils (chemical reactions, physical and chemical properties, saponification)	1	2
g. Chemistry and reaction of Carbenes and nitirene	1	2
h. Introduction to the basic principle photochemistry-Introductory concepts, The quantization of light and matter and the three principles of light matter interaction	1	2
i. Light nature and light sources	1	2
j. Light absorption and electronically excited states: Ground state (S_0), Excited states (S1, T1, T2), and energy transfer- fluorescence - phosphorescence	1	2

k. The fate of excited state: a) Physical radiative and non-radiative deactivations processes of the excited state (Jablonski diagram); b) Aspects of the chemical processes of excited states; c) Intermolecular radiationless transitions of excited states; d) Intermolecular physical processes of excited states	1	2
l. General types of photochemical reactions: The photochemistry of alkenes and carbonyl compounds. Photochemical cross-linking and degradation of polymers.	1	2
m. Applications of photochemistry in semiconductors (solar cells, storage of solar energy and its conversions)	1	2
n. Selected photochemical reactions	1	2

II-General scheme for identification of organic aliphatic unknown

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	-				28
Credit	2	-				2

3. Additional private study/learning hours expected for students per week. ☐

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Recognize the application of photochemistry	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • long and short essays
1.2	Name different organic classes and bioactive molecules such as carbohydrate, nucleic acid, lipids and proteins		
1.3	Know the basic principles of photochemical reactions		
1.4	Describe the different methods of preparations of organic bioactive molecules such as carbohydrate, lipids and proteins.		
1.5	Familiar with the physical and chemical properties of different organic bioactive molecules such as carbohydrate, lipids and		

	proteins		• posters lab manuals
1.8	Write a mechanism for a photochemical transformation		
1.9	Determine the type of mechanism and intermediates in different organic reactions such as carbens and nitrens		
1.12	Outline the general types of photochemical reactions		
1.13	Define the different electronical excitation states		
2.0	**Cognitive Skills**		
2.1	Apply the basic principles of photochemistry	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • posters • demonstrations
2.2	Compare between the different types of photochemical and pericyclic reactions		
2.3	Explain the different strategies for preparation of bioactive organic compounds		
2.4	Analyze the reasons for the unique physical properties in some bioactive organic compounds		
2.6	Summarize the different reactions of reactive intermediates such as carbenes and nitrenes		
3.0	**Interpersonal Skills & Responsibility**		
	• Ability to communicate results of work to classmates. • Ability to work in a team to perform a specific task.	• Scientific discussion • Web-based study	• web-based student performance systems
4.0	**Communication, Information Technology, Numerical**		
	• Evaluate the different methods of preparation of organic compounds • Demonstrate a synthetic pathways for synthesis of organic molecules • Use the internet as a means of communication and a source of information. • Encourage students to use internet for searching certain electronic journals regarding topics of the course. • Scientific writing. •	• Lectures • Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
5.0	**Psychomotor**		
5.1	NOT APPLICABLE		
5.2			

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %

2	First Periodic Exam.	6	20 %
3	Second Periodic Exam.	12	20 %
4	Final Exam.(2 hours exam)	16	50 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

- T. W. Graham Solomons, Craig B. Fryhle, Scott A. Snyder "*Organic Chemistry, 11th Edition, International Student Version*" **2013**, John Wiley & Sons.
- P. Finch, ***Carbohydrates: Structures, Syntheses and Dynamics***, Springer Science & Business Media, 2013.
- Ian Fleming, ***Pericyclic Reactions*** (Oxford Chemistry Primers) 1st Edition, 1999.
- Axel Griesbeck, Michael Oelgemöller, Francesco Ghetti, ***CRC Handbook of Organic Photochemistry and Photobiology***, Third Edition, 2012.

2. List Essential References Materials (Journals, Reports, etc.)

- Lecture Hand outs available on the coordinator website

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

- P. M. Collins, P. J. Ferrier, ***Monosacharides: Their Chemistry and Their Role in Natural Products,*** 1995, John Wiley & Sons
- Nicholas J. Turro, ***Modern Molecular Photochemistry***, University Science Books, 1991.

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com**
- **http://www.sciencedirect.com**
- **http://www.rsc.org**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)
   - **Classrooms capacity (30) students.**
   - **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

- **Room equipped with computer and projector and TV.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

Complete the questionnaire evaluation of the course in particular.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- **Observations and the assistance of colleagues.**
- **Independent evaluation for extent to achieve students the standards.**
- **Iindependent advice of the duties and tasks.**

3 Processes for Improvement of Teaching

- **Workshops for teaching methods.**
- **Continuous training of member staff.**
- **Review of strategies proposed.**
- **Providing new tools for learning.**
- **The application of e-learning.**
- **Eexchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for

improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: **Prof. Thoraya A. Farghaly**

Signature: **Date Report Completed: 2018**

Received by: Dr Ismail I. Althagafi **Department Head**

Signature: __________________________________ **Date: ________________**

B- Organic Chemistry Courses

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

COURSE SPECIFICATION

General Chemistry 1

4021101-4

1436 / 1437 H

Course Specification

Institution: Umm Al-Qura University

College/Department: Faculty of Applied Sciences / Chemistry Department

A. Course Identification and General Information

1. **Course title and code:** General Chemistry 1, 4021011-4
2. **Credit hours:** Four (3 theoretical + 1 practical) hrs.
3. **Program(s) in which the course is offered (If general elective available in many programs indicate this rather than list programs):**
   - **Chemistry**
   - **Industrial Chemistry**
   - **Physics**
   - **Medical Physics**
   - **Biology**
   - **Microbiology**
   - **Mathematics**
4. **Name of faculty member responsible for the course: Prof. Mohamed Ismail Awad**
5. **Level/year at which this course is offered:** 1st / 1
6. **Pre-requisites for this course (if any): ---------**
7. **Co-requisites for this course (if any): ---------**
8. **Location if not on main campus: ---------------**

B. Objectives

1. **Summary of the main learning outcomes for students enrolled in the course.**

This course is an introductory chemistry course designed to prepare students for college level chemistry courses. The course introduces some basic principles of physicl, organic and inorganic chemistry.

2.Briefly describe any plans for developing and improving the course that are being implemented. (eg increased use of IT or web based reference material, changes in content as a result of new research in the field).

- The use of teaching intelligent classes for lectures.
- Encourage students to prepare reports in general topics in chemistry.
- The use ofinformation technology orthe Internetin order to increaseawarenessof the conceptsof chemistry.

- Link the theoretical and practical sides of the course to help the students to understand and interpret the properties of the chemical compounds.

C. Course Description:(Note: General description in the form to be used for the Bulletin or Handbook should be attached).

1. Topics to be Covered		
Topic	No of Weeks	Contact hours
Units of measurements; SI- units, intensive and extensive properties, uncertainty in measurements (precision and accuracy).	1	3
Significant figures: Rounding significant figures, Using significant figures in addition, subtraction, multiplication and divisions.	1	3
States of matter and measurement, molecules and molecular compounds.	2	6
The periodic table, nomenclature, electronic structure of atoms, simple periodic properties of the elements.	2	6
Chemical bonding, molecular geometry, and properties of various states of matter.	1	3
Ions and ionic compounds, chemical reaction types.	1	3
Stoichiometry, atomic and molecular weights.	1	3
The mole, simple quantitative calculations with chemical reactions.	1	3
Basics of chemical equilibrium.	1	3
Acids and bases.	1	3
Thermochemistry.	1	3
Hydrocarbons, nomenclature and simple reactions.	1	3

Laboratory Experiments Outline

Topics to be Covered		
List of Experiments The practical part includes the following experiments:	No of Weeks	Contact hours
Introduction	**1**	**3**
Density and viscosity of liquids.	**1**	**3**
Compound type (polar – nonpolar – ionic).	**1**	**3**
Chemical reactions.	**1**	**3**
Acids and bases and pH measurements and calculations.	**1**	**3**
Titration of vinegar.	**1**	**3**
Oxidation-reduction reactions.	**1**	**3**

Molar mass of acid.	**1**	**3**
Qualitative analysis (acidic and basic radicals).	**1**	**3**
Collegative properties (determination of molecular weight).	**1**	**3**
Determination of the heat capacity of the calorimeter.	**1**	**3**
Determination of the critical solution temperature of phenol - water system	**1**	**3**
Review	**1**	**3**
Final Exam.	**1**	**3**

2. Course components (total contact hours per semester):

Lecture:	Tutorial:	Practical/Fieldwork/Internship:	Other:
42	---	**42**	

3. Additional private study/learning hours expected for students per week. (This should be an average: for the semester not a specific requirement in each week)
- 28 hours (2 hrs per week office hrs).

4. Development of Learning Outcomes in Domains of Learning
For each of the domains of learning shown below indicate:
A brief summary of the knowledge or skill the course is intended to develop;
A description of the teaching strategies to be used in the course to develop that knowledge or skill.
The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

Knowledge

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0			
1.1	Knows International system of units	Lectures Scientific discussion Library visits Web-based study	Exams portfolios long and short essays posters lab manuals
1.2	Familiar with the laws that describe the behavior of ideal gases.		
1.3	Knows atom structure		
1.4	Describe types of solids.		
1.5	Mention the first law of thermodynamics.		
1.6	List the factors affecting equilibrium position and equilibrium concentration.		
2.0	Cognitive Skills		
2.1	Summarize gases laws	Lectures	1. Midterm exam

2.2	Compare between ideal and real gases	Scientific discussion homework assignment containing problem thinking activities	2.quizzes 3.Final exam
2.3	Apply Hess's law for the calculation of heat of reaction.		
2.4	Apply Faraday's laws for calculating the amount deposited at electrodes		
2.5	Predict the spontaneity of chemical reaction.		
3.0	Interpersonal Skills & Responsibility		
	• Manage resources, time and collaborate with members of the group. • Ability to work independently to handle Chemicals and perform laboratory illustrations safely. • Ability to communicate results of work to classmates. • Ability to work in a team to perform a specific task	Team work groups General discussion with students for solving a problrm.	Assessment of the solution of problems submitted by the students.
4.0	Communication, Information Technology, Numerical		
	• Work effectively both in a team, and independently on solving chemistry problems. • Communicate effectively with his lecturer and colleagues • Use university library and web search engines for collecting information and search about different topics .	Write a Report Use libraries	Evaluation of the report presented
5.0	Psychomotor		
5.1	NOT APPLICABLE		
5.2			

5. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Proportion of Final Assessment
1	Class activities, Attendances and Duties	Throughout the Term	10%
2	Mid-Term Exam (s)	5-14	20%
3	Lab Activity and Final Exam on Lab	Throughout the Term	30%
4	Final Exam.(2 hours exam)	End of the Term	40%
5	Total		100%

D. Student Support

1. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)
Presence of faculty members to provide counselling and advice.
Office Hours: weekly during working hours, and to create appropriate means.

Academic Advising for students to those who need it, and taking into account the appropriate test for that Member.

E Learning Resources

1. Required Text(s) **P. Atkins and J. de Paula**, Physical Chemistry, 10th ed., 2006, New York.
2. Essential References Steven S. Zumdahl, Susan A. Zumdahl, 9th ed., 2009, New York.
3. Recommended Books and Reference Material (Journals, Reports, etc) (Attach List) Chemistry, R. Chang, 10th Edition, McGraw-Hill Higher Education, 2011.
4. Electronic Materials, Web Sites etc Power point lectures.
5. Other learning material such as computer-based programs/CD, professional standards Microsoft PowerPoint, Microsoft Word

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Lecture rooms, laboratories, etc.) Classroom capacity (60) students. To supply the classrooms with the appropriate educational means.
2. Computing resources Hall is equipped with a computer and Data Show and TV.
3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list) None

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching Complete thequestionnaireevaluation of the coursein particular. **Assess the progress of the operation by the students using the evaluation forms or group discussion in order to reach weaknesses and processed.**
2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor **Observationsandthe assistance ofcolleagues.** **Independent evaluation forextent toachieve students the standards.** **Iindependent adviceofthe dutiesandtasks.**
3 Processes for Improvement of Teaching • Workshopsforteaching methods. • Continuous trainingofmember staff.

- Review of strategies proposed.
- Providing new tools for learning.
- The application ofe-learning.
- Exchange of experiencesinternal andexternal.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- Check markingof a sampleofexam papers, orstudent work.
- Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- Periodic Reviewof thecontents ofthe syllabusandmodify thenegatives.
- Consultotherstaff ofthe course.
- Hostinga visiting staffto evaluate of thecourse.
- Workshopsfor teachers ofthe course.

Faculty or Teaching Staff: **Professor Mohamed Awad**

Signature: **Date Report Completed: March 2018**

Received by: Dr. Ismail Althagafi **Department Head**

Signature: ________________________________ **Date: _______________**

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Thermodynamics

4022135-3

Course Specifications
(CS)

Course Specifications

Institution: **Umm Al-qura University** Date of Report: **2016**

College/Department : **Faculty of Applied Science/ department of chemistry**

A. Course Identification and General Information

1. Course title and code: **Thermodynamics / 4022135-3**
2. Credit hours: **3 (2 theoretical + 1 practical)**
3. Program(s) in which the course is offered. **Chemistry**
4. Name of faculty member responsible for the course: **Professor Alaa El-Shafei**
5. Level/year at which this course is offered: **3rd level/2nd year**
6. Pre-requisites for this course (if any): **Volumetric Analytical Chemistry & Calculus**
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **both on El-Abedyah and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ■ What percentage? 100%

b**. Blend (traditional and online)** What percentage

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage? ☐

Comments:

B Objectives

1. What is the main purpose for this course?

By the end of this course the students will be able to:

1. Describe the fundamental principles of thermodynamics.

2. State the fundamental application of thermodynamic laws in various fields

3. Develop physical intuition, mathematical reasoning, and problem solving skills.

4. Analyze the thermodynamic data and predict the processes spontaneity

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

The students will be asked to prepare an essay or a report according to the literature survey using the library, data base services, and/or websites to follow up and update the topics related to the subject of the course.

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Theoretical part		
1. General introduction: objectives of the thermodynamics, some thermodynamics terms	1	2
2. Heat, energy and work (the mechanical equivalent of heat). Different types of systems	1	2
3. Thermodynamics variables and characteristics of intensive, extensive and thermodynamics processes.	1	2
4. Zero and first laws of thermodynamics and their applications	1	2
5. The relationship between enthalpy change and internal energy change, heat capacity	1	2
6. The Jules-Thompson's effect, Adiabatic and isothermal expansions, Determination of Joule's coefficient from heat capacity measurements.	1	2
7. Thermochemistry. Exothermic and endothermic reactions. Kirchhoff's law, Hess's law and its applications.	1	2
8. The second law of thermodynamics and its applications.	1	2
9. Spontaneous and non spontaneous processes. Heat machines and thermal efficiency		

10. Heat transfer to work. Carnot cycle (efficiency and compression ratio) Otto cycle.	1	2
11. Entropy. Gibbs free energy, work function, Gibbs and Gibbs – Helmholtz Equations.	1	2
12. Van't Hoff Equations, Chemical Equilibrium and spontaneity.	1	2
13. Third law of thermodynamics and its applications.	1	2
14. General revision	1	2
Laboratories		
• Instructions on rules and methods of safety at chemical lab.	1	3
• Introduction to the objectives of thermodynamics and various types of thermo-chemical reactions.	1	3
• Determination of the heat capacity and specific heat of the calorimeter using distilled water.	1	3
• Determination of the heat capacity of the calorimeter using solutions.	1	3
• Determination of the heat capacity for different concentration of sodium chloride solutions.	1	3
• Determination of the heat of neutralization between acid and alkali.	1	3
• Determination of the heat of salvation of ammonium chloride as an endothermic reaction at infinite dilution.	1	3
• Determination of the heat of salvation of sodium hydroxide as an exothermic reaction at infinite dilution.	1	3
• Hess's Law.	1	3
• Determination of the higher critical temperature for water-phenol system.	1	3
• Determination of the lower critical temperature in two component system.	1	3
• Three component systems.	1	3

• General revision	1	3
• Final practical exam	1	3

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	-	42			70
Credit	2	-	1			3

3. Additional private study/learning hours expected for students per week. 2hr

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	**Course Teaching Strategies**	**Course Assessment Methods**
1.0	**Knowledge**		
1.1	Recognize the intensive and extensive properties	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • long and short essays • posters • lab manuals
1.2	Know the classifications of thermodynamic systems		
1.3	Describe Joul and Joul-Thompson effects		
1.4	Familiar with systems and various dynamic processes.		
1.5	Identify the different thermodynamics functions		
1.6	Write thermal equations for various thermodynamic processes.		
1.7	Determine the relationship between chemical equilibrium and spontaneity.		
1.8	Memorize different laws of thermodynamics		
1.9	Outline the different uses of thermodynamics functions		
1.10	Define exothermic and exothermic reactions		
2.0	**Cognitive Skills**		
2.1	Apply the thermodynamic laws	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • posters
2.2	Compare between various thermodynamic systems		
2.3	Explain the conversion of heat to work		
2.4	Analyze the thermodynamic data		
2.5	Predict the spontaneity of the reactions		

2.6	Evaluate the efficiency of various heat engines		• individual and group presentations
3.0	**Interpersonal Skills & Responsibility**		
3.1 3.2	• Ability to work in a team to perform a specific experimental tasks. • Ability to work independently to handle chemicals • Ability to communicate results of work to classmate and participation in class or laboratory discussions	• Class discussions • Research activities	• Performance on in-practical exams. • Work on research activity. • Overall student performance in Lab. discussions • Cross questions after finishing laboratory work
4.0	**Communication, Information Technology, Numerical**		
4.1	Work effectively both in a team, and independently on solving chemistry problems.	• Scientific discussion • Library visits • Web-based study	• web-based student performance systems • Individual and group presentations.
4.2	Communicate effectively with his lecturer and colleagues		
4.3	Use IT and web search engines for collecting information**.**		
5.0	**Psychomotor**		
5.1 5.2	Laboratory practice . including 1.Locate Materials Safety Data Sheets, chemicals carcinogens list, and hazardous chemicals list. 2. Handle chemicals safely with a proper PPE 3.Dilute solutions, repeat analysis and calculate true result for all procedures performed as required. 4.Dispose the hazardous solution in right way	Practical session should include both demonstration and experiments .	1.Repetition of the experiments , to reproduce the results 2.Written report of chart and procedures. 3.The students should be able to correlate their results with experimental conditions

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment

1	Homework or activities.	--	10 %
2	Midterm Exam.	8	20 %
3	Practical Exam.	14	30 %
4	Final Exam.(2 hours exam)	16	40 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

- . الكيمياء الفيزيائية: J. Berro ترجمة أحمد محمد عزام واخرون – مكتبة الانجلو المصرية 1982م
- B. S. Bahl, Advanced Physical Chemistry, S. Chand & Co., 1993, New Delhi, India.
- R. A. Alberty and R. J. Silbey, Physical Chemistry, 1992, John Wiley & Sons.
- J. P. Bromberg, Physical Chemistry, 1980, Allyn and Bacon.
- P. Atkins and J. de Paula, Physical Chemistry, 7 th ed., Oxford University press, New York, 2014.

2. List Essential References Materials (Journals, Reports, etc.)

- Lecture Hand outs available on the coordinator website

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

- Thermodynamics: an engineering approach, Yunus A. Cengel and Michael A. Boles, 7 th. SI ed., McGraw- Hill, London, 2011.

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com**
- **http://www.sciencedirect.com**
- **http://www.rsc.org**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)
   - **Classrooms and lab of capacity (30) students.**
   - **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

   - **Rooms equipped with computer and projector and TV.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)
   - **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

Complete the questionnaire evaluation of the course in particular.

Assess the progress of the operation by the students using the evaluation forms or group discussion in order to reach weaknesses and processed.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- **Observations and the assistance of colleagues.**
- **Independent evaluation for extent to achieve students the standards.**
- **Iindependent advice of the duties and tasks.**

3 Processes for Improvement of Teaching

- **Workshops for teaching methods.**
- **Continuous training of member staff.**
- **Review of strategies proposed.**
- **Providing new tools for learning.**
- **The application of e-learning.**
- **Exchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: **Professor Alaa El-Shafei**

Signature: **Date Report Completed: March 2018**

Received by: Dr. Ismail Althagafi **Department Head**

Signature: ________________________________ **Date:** _______________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Electrochemistry

4022143-3

Course Specifications

Institution	**Umm Al-Qura University**	Date of Report
College/Department	**Applied Science /Chemistry Department**	

A. Course Identification and General Information

1. Course title and code: **Electrochemistry** / **4022143-3**

2. Credit hours **3 (2 theoretical +practical)**

3. Program(s) in which the course is offered.
(If general elective available in many programs indicate this rather than list programs)
Chemistry

4. Name of faculty member responsible for the course **Professor Alaa El-Shafei**

5. Level/year at which this course is offered
4th level/second year

6. Pre-requisites for this course (if any)
Chemical Kinetics-Thermodynamics

7. Co-requisites for this course (if any)

8. Location if not on main campus: **both on El-Abedyah and El-Zaher**

9. Mode of Instruction (mark all that apply)

a. Traditional classroom	☒	What percentage?	100 %
b. Blended (traditional and online)	☐	What percentage?	☐
c. e-learning		What percentage?	☐
d. Correspondence	☐	What percentage?	☐
f. Other		What percentage?	☐

Comments:

B Objectives

What is the main purpose for this course? • **List types of electrodes and types of electrochemical cells.** • **Types of standard electrodes and compare them.** • **Write Nernst equation and solve related problems.** • **List Faraday's laws and solve relevant problems.** • **Compare forms of corrosion** • **List types of fuel cells**
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) • **Using information technology and the Internet to prepare detailed research of everything new in the course.** • **Number of lecture contact hours will be increased to 4 to allow a chance to introduce new subjects as electrode kinetics and cyclic voltammetry.** • **Add lectures to review all new applications in the area of specialization through use of explanatory films and presentations (Video Projector), (power point)** • **Workshops and scientific forums regularly for more information and training.**

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact Hours
- **Introduction to electrochemistry-Types of electrochemical series** - **Standard redox potentials**	**2**	**4**
- **Cell potential**	**1**	**2**
- **Electrode potential and Nernst equation.**	**1**	**2**
- **Electrochemical series**	**1**	**2**
- **First exam**	**1**	**2**
- **Standard electrode potentials- Hydrogen and oxygen electrodes**	**1**	**2**
- **Concentration cells**	**1**	**2**

- Applications on cell potential	2	4
- Second exam	1	2
- Batteries and Fuel cells	1	2
- Forms of corrosion	2	4
- Corrosion Inhibition	1	2
- Final exam	1	2

Laboratory Part

Experiment	No. of weeks	Contact hours
Daniell Cell	1	3
Concentration cells	1	3
Electrodeposition at electrodes	1	3
Measurements of cell potential	1	3
Determination of solubility of sparingly soluble salt	1	3
Electroplating	1	3
Measurements of some electrochemical parameters from Tafel Plots	1	3
Determination of the corrosion inhibition efficiency of some inhibitors using Tafel plots	1	3
Determination of corrosion rates using weight loss method	1	3
Determination of the corrosion inhibition efficiency of some inhibitors using weight loss method	1	3
Determination of corrosion rates using thermometric method	1	3
Determination of the corrosion inhibition efficiency of some inhibitors using thermometric method	1	3
Revision	1	3
Final exam	1	3

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	**28**		42			70
Credit	2		1			3

3. Additional private study/learning hours expected for students per week. : 2hr

-

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

- **A brief summary of the knowledge or skill the course is intended to develop;**
- **A description of the teaching strategies to be used in the course to develop that knowledge or skill;**
- **The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.**

	NQF Learning Domains And Course Learning Outcomes	**Course Teaching Strategies**	**Course Assessment Methods**
1.0	**Knowledge**		
1.1	**To know terminology of electrochemistry**	**• Lectures** **• Scientific discussion** **• Library visits** **• Web-based study**	**• Exams** **• web-based student performance systems** **• portfolios** **• long and short essays** **posters lab manuals**
1.2	**Write Nernst equation for determination of cell potential**		
1.3	**List the applications of galvanic cells**		
1.4	**List types of electrodes**		
1.5	**To write about forms of corrosion**		
1.6	**To mention types of fuel cells**		
2.0	**Cognitive Skills**		
2.1	**Compare types of electrochemical cells and the**	**• Lectures** **• Scientific discussion**	**• web-based student performance systems**

	reaction at the half cells	• **Library visits** • **Web-based study**	• **portfolios** • **posters** **demonstrations**
2.2	**Solve Problems on Nernst equation**		
2.3	**Solve problems on Faraday's laws**		
2.4	**Apply Faraday's laws for calculating the amount deposited at electrodes**		
2.5	**Predict an assembly of galvanic cell**		
2.6	**Compare types of fuel cells**		
2.7	**Compare methods of inhibition of corrosion**		
3.0	**Interpersonal Skills & Responsibility**		
	• Ability to work in a team to perform a specific experimental tasks. • Ability to work independently to handle chemicals • Ability to communicate results of work to classmate and participation in class or laboratory discussions	• Class discussions • Research activities	• Performance on in-practical exams. • Work on research activity. • Overall student performance in Lab. discussions • Cross questions after finishing laboratory work
4.0	**Communication, Information Technology, Numerical**		
4.1	- **The ability to debate and dialogue with clear scientific method.**	- Lectures - Scientific discussion - Library visits - Web-based study	- web-based student performance systems - individual and group presentations
4.2	**The ability to present or explain scientific topic.**		
5.0	**Psychomotor**		
	Laboratory practice . including 1.Locate Materials Safety Data Sheets, chemicals carcinogens list, and hazardous chemicals list. 2. Handle chemicals safely with a proper PPE 3.Dilute solutions, repeat analysis and calculate true result for all procedures performed as required. 4.Pipette accurately at all times 5.Dispose the hazardous solution in right way	Practical session should include both demonstration and experiments .	1.Repetition of the experiments , to reproduce the results 2.Written report of chart and procedures. 3.The students should be able to correlate their results with experimental conditions

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment

1	Homework or activities.	--	10 %
2	Midterm Exam.	8	20 %
3	Practical Exam.	14	30 %
4	Final Exam.(2 hours exam)	16	40 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

Electrochemistry Principles, Methods and Applications, Christopher M. A. Brett, Maria Oliveira Brett, Oxford University Press, 2005.

2. List Essential References Materials (Journals, Reports, etc.)

1. **A.J. Bard ,L.R. Faulkner, Electrochemical Methods , Fundemental and Applications,2010 John Wiley & Sons**
2. **Handbook of Electrochemistry, Cynthia Zosk, Elsevier, 2011.**
3. **Handbook of Corrosion Engineering (Chinese), Pierre R. Roberge, McGraw-Hill, 2005.**
4. **Corrosion Basics: An Introduction, Pierre R. Roberge, NACE International, 2006.**

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com**
- **http://www.sciencedirect.com**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- **Classrooms capacity (30) students.**
- **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

- **Room equipped with computer and projector.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

Complete the questionnaire evaluation of the course in particular.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- **Observations and the assistance of colleagues.**
- **Independent evaluation for extent to achieve students the standards.**
- **Iindependent advice of the duties and tasks.**

3 Processes for Improvement of Teaching

- **Workshops for teaching methods.**
- **Continuous training of member staff.**
- **Review of strategies proposed.**
- **Providing new tools for learning.**
- **The application of e-learning.**
- **Eexchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: Professor Alaa El-Shafei

Signature: _________________________________ Date Report Completed: ____2018______

Received by: Dr. Ismail Althagafi Department Head

Signature: _________________________________ Date: ________________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Kinetic Chemistry

4022144-3

Course Specifications

(CS)

Course Specifications

Institution: **Umm Al-Qura University** Date of Report: **2015**

College/Department : **Faculty of Applied Science/ Department of Chemistry**

A. Course Identification and General Information

1. Course title and code: **Kinetic Chemistry / 4022144-3**
2. Credit hours: **3 (2 theoretical + 1 practical)**
3. Program(s) in which the course is offered. **Chemistry program**
4. Name of faculty member responsible for the course: **Dr. Ahmed Fawzy Saad**
5. Level/year at which this course is offered: **5th level/3rd year**
6. Pre-requisites for this course (if any): **Thermodynamics + Volumetric and Gravimetric Analytical Chemistry**
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **both on El-Abedyah and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom	☒	What percentage?	**100%**
b**. Blended (traditional and online)**		What percentage?	
c. e-learning	☐	What percentage?	☐
d. Correspondence	☐	What percentage?	☐
f. Other	☐	What percentage?	☐

Comments:

B Objectives

1. What is the main purpose for this course?

By the end of this course the students will be able to:

1. Describe the principles of kinetic chemistry.
2. Follow a reaction by different techniques.
3. Determine the rate law from the experimental data.
4. Analyze the experimental data of a given reaction.
5. Write the sequence of the elementary steps "mechanism" of a reaction.
6. Describe the fundamentals of catalysis and influence of the catalysts on the reaction rate.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

1. Encourage students to make reports in the field of kinetic chemistry from the library or using the Internet.
2. Use the websites to follow up and update the new topics of the subject of the course.

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
General concepts in chemical kinetic – reaction rate – rate laws – reaction order – half-life time.	**1**	**2**
Factors affecting the rate of reaction.	**1**	**2**
Conventional techniques of following a reaction: chemical methods - physical methods.	**1**	**2**
Integration of simple rate laws: zero, first, second and third order reactions and examples.	**1**	**2**
Pseudo-first order reactions - fractional order reactions – higher order reactions and examples.	**1**	**2**
General revision and Mid-Term Exam.	**1**	**2**
Determining the rate law from experimental data: Isolation method - Differential methods - Integral methods – Method of Half lives.	**1**	**2**
Dependence of rate on temperature - The Arrhenius equation and activation energy.	**1**	**2**
Theories of chemical reactions - collision theory, transition-state theory.	**1**	**2**
Kinetics of complex reactions.	**1**	**2**
Effect of catalyst on the reaction rate.	**1**	**2**
Kinetics of catalysis by enzymes.	**1**	**2**
Kinetics of photochemical reactions.	**1**	**1**
Kinetics of reactions in solutions.	**1**	**2**

Laboratory Part:

1. Catalytic decomposition of hydrogen peroxide as a first order reaction.
2. Hydrolysis of ester as pseudo-first order reaction.
3. Saponification of ester as a second order reaction.
4. Persulfate-iodide reaction.
5. Oxidation of hydrogen peroxide to determine the order and the thermodynamic parameters.
6. Halogenation of acetone in solution as a zero order reaction.
7. Autocatalytic reaction between potassium permanganate and oxalic acid.

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	-	42		-	70
Credit	2	-	1		-	3

3. Additional private study/learning hours expected for students per week. 2hr

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	List the conventional techniques of following a reaction and select the appropriate one to the given reaction.	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • long and short essays • posters lab manuals
1.2	Mention the different reaction orders and their rate laws.		
1.3	Define the reaction rate constant of various reaction orders.		
1.4	List the factors affecting the reaction rate.		
1.5	List the different types of complex reactions and their rate laws.		
1.6	Explain the catalysis and its effect on the reaction rate.		
1.7	Explain the kinetics and mechanism of enzymatic reactions.		
1.8	Explain the kinetics and mechanism of photochemical reactions.		
1.9	Describe the factors affecting the reactions in solutions and the kinetics of these reactions.		

2.0	**Cognitive Skills**		
2.1	Compare between the different experimental techniques of following a reaction.	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • posters • demonstrations
2.2	Solve the rate-law expressions for different reaction orders.		
2.3	Solve the kinetic problems for all orders.		
2.4	Give a concise interpretation of the mechanism of various reactions.		
3.0	**Interpersonal Skills & Responsibility**		
3.1	• Ability to work in a team to perform a specific experimental tasks. • Ability to work independently to handle chemicals • Ability to communicate results of work to classmate and participation in class or laboratory discussions	• Class discussions • Research activities	• Performance on in-practical exams. • Work on research activity. • Overall student performance in Lab. discussions • Cross questions after finishing laboratory work
3.2			
4.0	**Communication, Information Technology, Numerical**		
4.1	Work effectively both in a team, and independently on solving chemistry problems.	• Lectures • Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
4.2	Communicate effectively with his lecturer and colleagues		
5.0	**Psychomotor**		
5.1	Laboratory practice . including 1.Locate Materials Safety Data Sheets, chemicals carcinogens list, and hazardous chemicals list. 2. Handle chemicals safely with a proper PPE 3.Dilute solutions, repeat analysis and calculate true result for all procedures performed as required. 4.Pipette accurately at all times 5.Dispose the hazardous solution in right way	Practical session should include both demonstration and experiments .	1.Repetition of the experiments , to reproduce the results 2.Written report of chart and procedures.
5.2			

			3.The students should be able to correlate their results with experimental conditions

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	Midterm Exam.	8	20 %
3	Practical Exam.	14	30 %
4	Final Exam.(2 hours exam)	16	40 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- We have faculty members to provide counselling and academic advice.
- 2 hours per week as office hours are available for discussion with the students.

E. Learning Resources

1. List Required Textbooks

*** An Introduction to Chemical Kinetics, Margaret Robson Wright, New York, John Wiley & Sons, 2004.**

*** Kinetics of Chemical Reactions, Guy Marin, Gregory S. Yablonsky, John Wiley, 2011.**

*** Chemical Kinetics, Luis Arnaut, Sebastiao Formosinho, Hugh Burrows, 1st ed., Elsevier Science, 2006.**

2. List Essential References Materials (Journals, Reports, etc.)

*** Lecture Hand outs available on the coordinator website.**

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

*** Physical Chemistry, Amazon logo *Silbey, R. R. Alberty, M. Bawendi, 4th ed., John Wiley & Sons, 2004.***

*** Physical Chemistry, Peter Atkins & Julio de Paula, 10th *ed., W. H. Freeman* and *Company, 2014.***

*** Principles of Chemical Kinetics, Second Edition, James E. House, 2nd ed., Academic Press, 2007.**

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http//:en.wikipedia.org/wiki/**
- **http//:www.chemweb.com/**
- **Websites on the internet relevant to the topics of the course**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

* Appropriate teaching class including white board and data show with at least 25 seats.

* Chemistry laboratories.

2. Computing resources (AV, data show, Smart Board, software, etc.)

* Computer Halls access for the students will be helpful in doing their tasks during the course.

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

* No other requirements.

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Student discussion with the instructor allow for continuous feed back through the course progress.
- Student Evaluation Questionnaires.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- Discussions within the group of faculty teaching the course.
- Peer consultation on teaching strategies and its effectiveness.

3 Processes for Improvement of Teaching

- Workshops given by experts on new teaching and learning methodologies will be attended.
- Improving of the teaching strategies by monitoring the evaluation of the students progress through the semester

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

* Not effective yet.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. - The course will be evaluated periodically after each semester based on the results of the students and the report presented by the teaching stuff that will be discussed with the course coordinator so as to improve the course.

Faculty or Teaching Staff: Dr. Ahmed Fawzy

Signature: **Date Report Completed: 2018**

Received by: Dr. Ismail Althagafi Department Head

Signature: ________________________________ Date: _______________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Colloid Chemistry and Phase Rule

4022146-1

Course Specifications
(CS)

Course Specifications

Institution **Umm Al-Qura University** Date of Report **2015**

College/Department **Faculty of Applied Science/ Department of Chemistry**

A. Course Identification and General Information

1. Course title and code: **Colloid Chemistry and Phase Rule- 4022146-1**
2. Credit hours: **1hrtheoretical)**
3. Program(s) in which the course is offered. **Chemistry**
4. Name of faculty member responsible for the course: **Dr. Ahmed Fawzy Saad**
5. Level/year at which this course is offered: **5th level/third Year**
6. Pre-requisites for this course (if any) **General Chemistry (2)**
7. Co-requisites for this course (if any): **none**
8. Location if not on main campus: **both on El-Abedyah and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom	☐	What percentage?	☐
b. Blended (traditional and online)	☒	What percentage?	**100%**
c. e-learning	☐	What percentage?	☐
d. Correspondence	☐	What percentage?	☐
f. Other	☐	What percentage?	☐

Comments:

B Objectives

1. What is the main purpose for this course? **By the end of the study of this course have students familiar with** • **the basic concepts of colloid chemistry** • **types of colloids and there preparation methods** • **properties of colloids and their applications** • **basics of phase rule and its important** • **examples of phase rule to mono, di and tri component systems**
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) **Use smart teaching halls for lectures.** *** Encourage students to link colloid chemistry course and what studied numerous applications in various domains such as Chemistry and medicine and Pharmacy and the food industry, water purification and industry and succession through work reports both from the library or using the Internet (self-teaching) and through discussion with Standing**

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
1-Definition of colloids with examples	**1**	**2**
2- Classification of colloids	**1**	**2**
3- Theory of colloid stabilization	**1**	**2**
4- Methods of colloids preparations	**1**	**2**
5- Colloid technology **6- Colloid properties**	**1**	**2**
7- Importance of colloids and its importance	**1**	**2**
8- Definition of phase rule	**1**	**2**
9- Physical changes dynamics	**1**	**2**
10- Cielus Calpyron Equation	**1**	**2**
11- Studying phase rule low	**1**	**2**
12- Phase rule of one component system	**1**	**2**
13- Phase rule of two component system	**1**	**2**

14- Phase rule of three component system	**1**	**2**
15- General Revision and Exam	**1**	**2**

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	**28**	**-**	**-**	**-**		**28**
Credit	**2**	**-**	**-**	**-**		**2**

3. Additional private study/learning hours expected for students per week. **1 hour/week**

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Mention the main differences between colloids and suspension and true solution.	1.Lectures using white board and data show 2. Problem classes 3. discussion groups	1.Midterm exam 2.quizzes 3.Group discussion 4.Final exam
1.2	List the preparation and purifying of colloidal solutions.		
1.3	Describe characteristics of colloidal solutions.		
1.4	Describe the most important applications of colloidal solutions.		
1.5	Describe the phase rule and its classifications.		
1.6	Mention equilibrium curves for different systems.		
2.0	**Cognitive Skills**		
2.1	Compare between colloids and suspension and true solution.	• Scientific discussion • Library visits	• web-based student performance
2.2	Give concise about the characteristics of colloidal		

	solutions	• Web-based study	systems • portfolios • posters • demonstrations
2.3	Analyze the relations between different phases of material.		
2.4	Apply equilibrium curves for different systems		
3.0	**Interpersonal Skills & Responsibility**		
3.1	Manage resources, time and collaborate with members of the group.	1. Team work groups for cooperative work making. 2. Presenting the analysis and interpretation of a case study for each group to the other groups in class. 3.Open a general discussion with students in the area of educational issues for knowledge transfer between the students.	1.Writing group scientific report for a case study. 2.Assessment of the solution of problems submitted by the students.
	Use university library and web search engines for collecting information and search about different topics .		
4.0	**Communication, Information Technology, Numerical**		
4.1	Work effectively both in a team, and independently on solving chemistry problems.	1.Write a Report 2.Use digital libraries and/or E-Learning Systems for the communication with lecturer through the course work	1.Evaluating the activities of the students through the semester for their activities on the E-learning system, as well as, their communication with each other in different tasks. 2.Evaluation of the report presented
4.2	Communicate effectively with his lecturer and colleagues		
4.3	Use IT and web search engines for collecting information**.**		
5.0	**Psychomotor**		
5.1	NOT APPLICABLE		

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	First Periodic Exam.	6	20 %

3	Second Periodic Exam.	12	20 %
4	Final Exam.(2 hours exam)	16	50 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

*** Handbook of Applied Surface and Colloid Chemistry, Vol. 1-2, Holmberg, Krister, John Wiley & Sons, New York, 2002.**

*** PHYSICAL CHEMISTRY IN BRIEF, Josef P. Novak, Stanislav Labık, Ivona Malijevska, Institute of Chemical Technology, Prague, 2005.**

2. List Essential References Materials (Journals, Reports, etc.)

*** Lecture Hand outs available on the coordinator website .**

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

*** Emulsions, Foams, and Suspensions: Fundamentals and Applications, Laurier L. Schramm, WILEY-VCH Verlag GmbH & Co, 2005.**

*** Colloidal Chemistry, A. Goel, Discovery Publishing House, 1st ed., New Delhi, 2006.**

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com**
- **http://www.sciencedirect.com**
- **http://www.rsc.org**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- **Classrooms capacity (30) students.**
- **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

- **Room equipped with computer and projector and TV.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

Complete the questionnaire evaluation of the course in particular.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- **Observations and the assistance of colleagues.**
- **Independent evaluation for extent to achieve students the standards.**
- **Independent advice of the duties and tasks.**

3 Processes for Improvement of Teaching

- **Workshops for teaching methods.**
- **Continuous training of member staff.**
- **Review of strategies proposed.**
- **Providing new tools for learning.**
- **Application of e-learning.**
- **Eexchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: Dr. Ahmed Fawzy Saad

Signature: **Date Report Completed: 2018**

Received by: Dr. Ismail Althagafi Dean/Department Head

Signature: _______________________________ **Date:** _______________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specifications
(CS)

Quantum Chemistry

4023553-2

Course Specifications

Institution: **Umm Al-qura University**	Date of Report: **2016**
College/Department : **Faculty of Applied Science/ Department of chemistry**	

A. Course Identification and General Information

1. Course title and code: **Quantum Chemistry/4023553-2**
2. Credit hours: **2 hours (theoretical)**
3. Program(s) in which the course is offered. **Chemistry**
4. Name of faculty member responsible for the course: **Dr Jaber Al- Fahemi**
5. Level/year at which this course is offered: **3rd level/2nd year**
6. Pre-requisites for this course (if any): **General chemistry1 + calculus**
7. Co-requisites for this course (if any) -
8. Location if not on main campus: **both on El-Abedyah and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom	■	What percentage?	100%
b. Blended (traditional and online)	☐	What percentage?	
c. e-learning	☐	What percentage?	
d. Correspondence	☐	What percentage?	
f. Other	☐	What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course? By the end of this course the students will be able to: 1. describe the fundamental principles of quantum chemistry. 2. State the fundamental postulates of quantum mechanics. 3. develop physical intuition, mathematical reasoning, and problem solving skills. 4. write the solution of Schrodinger equation for some simple systems. 5. be further prepared for the necessarily rigorous sequence in chemistry courses needed the quantum chemistry
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) 1. Computer labs to be used in teaching the student the basics of the application of the quantum chemistry soft ware used in the simulation, molecular modeling and quantum chemical calculations. 2. encourage students to make reports in the recent trends in the field of quantum chemistry, either from the library or by using the Internet.

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Basics of Quantum Theory – Introduction to Quantum Mechanics And Its Origin – Properties of Wave Function.	2	2
Solution of Schrödinger Equation – Applications of Schrödinger Equation - A Particle Moving in A Box With Different, One – Two – Three, Dimensions - Predict the Wave Function Equation and the Energy in Each Case.	2	4
Operators and its Importance in Quantum Chemistry - Eigen Functions and Eigen Values	1	2
Schrödinger Equation Of Hydrogen Atom- Wave Function Equation and Energy	2	4
Different Quantum Numbers and their Uses in Describing the Orbitals and the Energy Levels.	1	2
Quantum Theory and Molecular Structure – Born-Oppenheimer Approximation.	1	2
revision	1	2
Molecular Orbital Theory and Molecular Structure-	1	2

Linear Combination of Atomic Orbitals (LCAO).		
Application of Molecular Orbital Theory on Homonuclear Molecules.	1	2
Application of Molecular Orbital Theory on Heteronuclear Molecules	1	2
Overlap Matrix- Correlation Diagrams.	1	2
Revision	1	2

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	-	-	-	-	28
Credit	2	-	-	-	-	2

3. Additional private study/learning hours expected for students per week. -

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	List the historical development of the Origins of quantum theory	1.Lectures using white board and data show 2. Problem classes 3. discussion groups	1.Midterm exam 2.quizzes 3.Group discussion 4.Final exam
1.2	Illustrate, qualitatively and quantitatively, the role of photons in understanding phenomena like the photoelectric effect and Compton scattering.		
1.3	describe the experiments displaying wave like behavior of matter, and how this motivates the need to replace classical mechanics by a wave equation of motion for matter (the Schrödinger equation).		
1.4	mention the basic concepts and principles of quantum mechanics: The Schrödinger equation, the wave function and its physical interpretation, Eigen values and Eigen functions, expectation values and uncertainty.		
1.5	define the concepts of spin and angular momentum, as well as their quantization- and addition rules.		
1.6	Explain physical properties of atoms and molecules based on		

	quantum Chemical formulations.		
1.7	describe a Qualitative treatment of the LCAO-MO for homonuclear and heteronuclear diatomic molecules as a well as Simple Hückel Molecular Orbital theory.		
2.0	**Cognitive Skills**		
2.1	Give concise physical interpretations and discussions of quantum mechanics postulations in molecular orbitals treatment.	1. group discussions 2. case study. 3. home work assignment containing problem thinking activities	1.Midterm exam 2.quizzes 3.Group discussion 4.Final exam
2.2	solve the Schrödinger equation for simple one-dimensional systems and conclude the probabilities, Eigen and expectation values for these systems.		
2.3	compare between the different energies of the rigid rotors and harmonic oscillator models based on the solution of their Schrödinger equation.		
2.4	Solve the Schrödinger equation for the hydrogen like elements.		
3.0	**Interpersonal Skills & Responsibility**		
3.1	NOT APPLICABLE		
3.2	Use university library and web search engines for collecting information and search about different topics .		
4.0	**Communication, Information Technology, Numerical**		
4.1	Work effectively both in a team, and independently on solving chemistry problems.	1.Write a Report 2.Use digital libraries and/or E-Learning Systems for the communication with lecturer through the course work	1.Evaluating the activities of the students through the semester for their activities on the E-learning system, as well as, their communication with each other in different tasks. 2.Evaluation of the report presented
4.2	Communicate effectively with his lecturer and colleagues		
4.3	Use IT and web search engines for collecting information.		
5.0	**Psychomotor**		
5.1	NOT APPLICABLE		

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	First Periodic Exam.	6	20 %
3	Second Periodic Exam.	12	20 %
4	Final Exam.(2 hours exam)	16	50 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- We have faculty members to provide counseling and academic advice.
- 2 hours per week as office hours are available for discussion with the students.

E. Learning Resources

1. List Required Textbooks

1- Ajit J Thakkar, Quantum Chemistry, Morgan & Claypool Publishers, 2014.

2- Donald A. McQuarrie, Quantum Chemistry, University Science Books, 2008.

2. List Essential References Materials (Journals, Reports, etc.)

journal of Molecular Structure (Elsevier)

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

1- Peter Atkins and Ronald Friedman, Molecular Quantum Mechanics, Oxford University Press, 2005.

2- David O. Hayward, Quantum Mechanics for Chemists, Royal Society of Chemistry, 2002.

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- http//:en.wikipedia.org/wiki/
- http//:www.chemweb.com/
- Websites on the internet relevant to the topics of the course

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

Hyperchem or Spartan software will be helpful beside some free software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

Appropriate teaching class including white board and data show with at least 25 seats.

2. Computing resources (AV, data show, Smart Board, software, etc.)

Computer Halls access for the students will be helpful in doing their tasks during the course.

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

Computational software will be helpful such as Spartan or hyperchem program packages.

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Student discussion with the instructor allow for continuous feed back through the course progress.
- Student Evaluation Questionnaires.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- Discussions within the group of faculty teaching the course.
- Peer consultation on teaching strategies and its effectiveness.

3 Processes for Improvement of Teaching

- Workshops given by experts on new teaching and learning methodologies will be attended.
- Improving of the teaching strategies by monitoring the evaluation of the students progress through the semester

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

Not effective yet.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- The course will be evaluated periodically after each semester based on the results of the students and the report presented by the teaching stuff that will be discussed with the course coordinator so as to improve the course.

Faculty or Teaching Staff: Jaber Al- Fahemi

Signature: **Date Report Completed: 2018**

Received by: Dr. Ismail Althagafi Head of the Department

Signature: _________________________________ Date: ________________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specifications
(CS)

Surface chemistry

4023554-3

Course Specifications

Institution: **Umm Al-Qura University**	Date of Report
College/Department /**Applied Science /Chemistry Department**	

A. Course Identification and General Information

1. Course title and code: **Surface chemistry/ 4023554-3**

2. Credit hours: **3 (2 theoretical + 1 practical)**

3. Program(s) in which the course is offered. **Chemistry**
(If general elective available in many programs indicate this rather than list programs)

4. Name of faculty member responsible for the course: **Prof. Dr Abd El Rahman Khedr**

5. Level/year at which this course is offered:**6/3th**

6. Pre-requisites for this course (if any) **Colloids and phase rule**

7. Co-requisites for this course (if any)---------

8. Location if not on main campus: **both on El-Abedyah and El-Zaher**

9. Mode of Instruction (mark all that apply)

a. Traditional classroom ■ What percentage? 100 %

b. Blended (traditional and online) What percentage? 70% ☐

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other What percentage? 30% ☐

Comments:

B Objectives

1. What is the main purpose for this course? The objectives of this course are to enable students to get information about surface tension and its determination, and study the nature of solid surface. Also the student should know the adsorption of gas on solid surface. Also , at the end of this course the student should know the most recent surface characterization techniques
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) **The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course.**

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Introduction in surface tension and its determination	1	2
▪ kelvin and young Laplace equations	1	2
Effect of temperature on surface tension and Parachor	1	2
▪ Single crystal surface, simple and complex surface structures and Millar indices ▪ Relaxed, reconstructed, faceted surfaces	3	6
Periodic Exam	1	2
▪ Bimetallic surfaces. ▪ Adsorption of gas on solid surfaces, and method of determination	2	4

▪ Frindlish, Langmuir and BET adsorption isotherms	2	4
▪ Some microscopic and spectroscopic tools of surface characterization such as: SEM, TEM, AFM, STM, XRD , XPS,…………	2	4
▪ Finial exam	1	2

Laboratory part:

Introduction to surface tension
Determination of the radius of the capillary tube using capillary rise method
Determination of the surface tension of different liquids using the capillary rise method.
Determination of the surface tension of water by the capillary rise method at different temperature
Determination of surface tension of liquids using capillary tubes of different diameters
Determination of surface adsorption of amyl alcohol from aqueous solutions
Adsorption of Acetic acid on activated charcoal **(Study the Effect of concentration on adsorption)**
Adsorption of oxalic acid on activated charcoal **(Study nature of adsorbate using Freundlich isotherm)**
Adsorption of Oxalic acid on activated charcoal **(Application of Langmuir isotherm)**
Heat of adsorption of acetic acid on activated charcoal

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28		42			70
Credit	2		1			3

3. Additional private study/learning hours expected for students per week. ☐

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Recognize the surface tension and its determination	Lectures Lab.	Exams lab manuals

1.2	Write the equations of gas adsorption on the solid	Lectures Lab	Exams lab manuals
2.0	**Cognitive Skills**		
2.1	Compare between techniques used in surface	Lab, Lectures	Exams lab manuals
2.2	Apply the adsorption equations in the Lab.	Lab, Lectures	
3.0	**Interpersonal Skills & Responsibility**		
• Ability to work in a team to perform a specific experimental tasks. • Ability to work independently to handle chemicals • Ability to communicate results of work to classmate and participation in class or laboratory discussions		• Class discussions • Research activities	• Performance on in-practical exams. • Work on research activity. • Overall student performance in Lab. discussions • Cross questions after finishing laboratory work
4.0	**Communication, Information Technology, Numerical**		
• Evaluate the different methods of surface tension determination • Enhancing the ability of students to use computers and internet. • Interpret chemical data • Present chemical data orally. • Know how to write a report. • Demonstrate the methods used in adsorption .		Lab, Lectures	Exams lab manuals
5.0	**Psychomotor**		
5.1	Laboratory practice . including 1.Locate Materials Safety Data Sheets, chemicals carcinogens list, and hazardous chemicals list. 2. Handle chemicals safely with a proper PPE 3.Dilute solutions, repeat analysis and calculate true result for all procedures performed as required. 4.Dispose the hazardous solution in right way	Practical session should include both demonstration and experiments .	1.Repetition of the experiments , to reproduce the results 2.Written report of chart and procedures. 3.The students should be able to correlate their results with experimental conditions
5.2			

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment

1	Homework or activities.	--	10 %
2	Midterm Exam.	8	20 %
3	Practical Exam.	14	30 %
4	Final Exam.(2 hours exam)	16	40 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- Presence of faculty members to provide consulting and advice.
- Office hours: during the working hours weekly, and the creation of appropriate means.

E. Learning Resources

1. List Required Textbooks

1. **Surface Analysis: The Principal Techniques, 2nd Edition, John C. Vickerman, Ian Gilmore, Wiley, 2009.**
2. **Surface Chemistry, Elaine M. Mc Cash , 1st ed., Oxford University Press, 2001.**
3. Introduction to Applied Colloid and Surface Chemistry, Georgios M. Kontogeorgis & Soren Kiil, WILEY, 2016
4. Surface and Colloid Chemistry, Principles and Applications, K. S. Birdi, CRC Press, Taylor and Francis Group, 2010

2. List Essential References Materials (Journals, Reports, etc.)

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

1. **Surface Analysis: The Principal Techniques, 2nd Edition, John C. Vickerman, Ian Gilmore, Wiley, 2009.**
2. **Surface Chemistry, Elaine M. Mc Cash , 1st ed., Oxford University Press, 2001.**
3. Introduction to Applied Colloid and Surface Chemistry, Georgios M. Kontogeorgis & Soren Kiil, WILEY, 2016
4. Surface and Colloid Chemistry, Principles and Applications, K. S. Birdi, CRC Press,

Taylor and Francis Group, 2010

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

-http://en.wikipedia.phys/wiki/Petroleum1
-http://www.chemhelper.com/
- http://www.chemweb.com/

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

-Microsoft PowerPoint, Microsoft Word
-Videos on the chemistry of surfaces.
- Educational CD for surface Chemistry correlated with other themes

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)
-classroom capacity (30) students.

2. Computing resources (AV, data show, Smart Board, software, etc.)

Hall equipped with a computer and the Data Show and Television is urgently required

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)
No other requirements

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

Scheduled to complete the questionnaire calendar in particular.
- Focus group discussions with small groups of students.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor
Feedback and assistance from colleagues.
- Independent evaluation of the extent to which students of the standards.
- independent advice to the duties and tasks

3 Processes for Improvement of Teaching **Workshops for the teaching methods.** **- Continuous training for the faculty member.** **- Revision of the proposed strategies.** **- The provision of modern tools necessary for learning.** **- Application of the means of e-learning.** **- Exchange of internal and external experiences**
4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) **Checking the samples of test papers, or student work, which has been corrected by a faculty member.** **- Exchange professors from different educational institutions on regular basis to correct samples of test papers**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

Consult with other professors teaches the same subject.
- Hosting a visiting professor to evaluate the subject.
- Workshops for teachers whom teach the same subject.
- Periodic review for teachers to modify the negatives contents in the subject.

Faculty or Teaching Staff: Prof. Dr Abd El Rahman Khedr

Signature: _________________________________ Date Report Completed: _____2018__________

Received by: ___ Dr. Ismail Althagafi _________ Department Head

Signature: _________________________________ Date: ________________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specifications
(CS)

Chemistry of Catalysts

4023563-3

Course Specifications

Institution **Umm Al-Qura University** Date of Report

College/Department **Applied Science /Chemistry Department**

A. Course Identification and General Information

1. Course title and code: **Chemistry of Catalysis / 4023563-3**
2. Credit hours 3 (2 theoretical + 1 practical)
3. Program(s) in which the course is offered. **chemistry**
(If general elective available in many programs indicate this rather than list programs)
4. Name of faculty member responsible for the course: **Prof. Dr Abd El Rahman Khedr**
5. Level/year at which this course is offered:7th /4
6. Pre-requisites for this course (if any)
Surface chemistry
7. Co-requisites for this course (if any)…………..
8. Location if not on main campus: **both on El-Abedyah and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom	☒	What percentage? 100%	
b. Blended (traditional and online)		What percentage?	☐
c. e-learning	☐	What percentage?	☐
d. Correspondence	☐	What percentage?	☐
f. Other		What percentage? 30%	☐

Comments:

B Objectives

1. What is the main purpose for this course?

The basic objectives of this course are to study an introduction on catalysis and the methods of catalysts preparation. Homogeneous and heterogeneous catalysis. The student also will study the most recent spectroscopic and microscopic tools of catalyst characterization. Also, the student will study some applications of catalytic process

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course.

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact Hours
Introduction (The phenomenon catalysis, mode of action of catalysts, activity, turnover Frequency TOF, turnover number TON [T 46], selectivity, stability, classification of catalysts and comparison of homogeneous and heterogeneous catalysis).	2	4
Economic importance of catalysts. Methods of catalyst preparation	3	6
exam	1	2
• Some spectroscopic and microscopic tools of catalyst characterization.	2	4
Examples include catalysts for oxidation, including pollution clean-up; hydrogenation including hydrogenation and refining processes	3	6
• Pollution control with particular reference to car exhausts	2	4
exam	1	2

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28		42			70
Credit	2		1			3

3. Additional private study/learning hours expected for students per week. 2hr

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Recognize the types of catalysis	• Lectures • Scientific discussion	Exams web-based student performance systems
1.2	Write the methods of catalyst preparation		
1.3	Define the catalyst activity, selectivity, TOF, TON….		
2.0	**Cognitive Skills**		
2.1	Compare between homogeneous and heterogeneous catalysis	• Lectures • Scientific discussion	Exams web-based student performance systems
2.2	Compare different methods of catalyst preparation		
1.3	Compare between catalytic reactors		
3.0	**Interpersonal Skills & Responsibility**		
	• Ability to work in a team to perform a specific experimental tasks. • Ability to work independently to handle chemicals • Ability to communicate results of work to classmate and participation in class or laboratory discussions	• Class discussions • Research activities	• Performance on in-practical exams. • Work on research activity. • Overall student performance in Lab. discussions • Cross questions after finishing laboratory work
4.0	**Communication, Information Technology, Numerical**		

	• Calculate the reaction yields and product selectivity • Select suitable reactor for certain reaction • Able to calculate and discuss the facts and logical propose methods to solve the difficulties. • Use IT and communication technology in gathering and interpreting information and ideas.	Lab, Lectures	web-based student performance systems individual and group presentations
5.0	**Psychomotor**		
5.1	• Ability to work in a team to perform a specific experimental tasks. • Ability to work independently to handle chemicals • Ability to communicate results of work to classmate and participation in class or laboratory discussions	• Class discussions • Research activities	• Performance on in-practical exams. • Work on research activity. • Overall student performance in Lab. discussions • Cross questions after finishing laboratory work
5.2			

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	Midterm Exam.	8	20 %
3	Practical Exam.	14	30 %
4	Final Exam.(2 hours exam)	16	40 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- Presence of faculty members to provide consulting and advice.

- Office hours: during the working hours weekly, and the creation of appropriate means.

E. Learning Resources

1. List Required Textbooks
    1. Catalysis Concepts and Green Applications, Gadi Rothenberg **, John Wiley & Sons, 2008.**
    2. Catalysis for Renewables From Feedstock to Energy Production, Gabriele Centi and Rutger A. van Santen, WILEY-VCH Verlag GmbH & Co.KGaA, Weinheim, **2007**.
    3. Synthesis of Solid Catalysts, Krijn P. de Jong, WILEY-VCH Verlag GmbH & Co.KGaA, Weinheim, **2007**.
    4. Industrial Catalysis: A Practical Approach, Second Edition. Jens Hagen WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim, **2006**, ISBN: 3-527-31144-0.
    5. B. Cornils, W. A. Herrmann, R. Schlögl, C.-H. Wong Catalysis from A to Z A Concise Encyclopedia 2nd ed **2003**, ISBN 3-527-30373-1
    6. Catalytic Air Pollution Control: Commercial Technology, Johnson Matthey PLC, Orchard Road, Royston, Hertfordshire SG8 5HE, UK; **2010**

2. List Essential References Materials (Journals, Reports, etc.)

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)
    1. Catalysis Concepts and Green Applications, Gadi Rothenberg **, John Wiley & Sons, 2008.**
    2. Catalysis for Renewables From Feedstock to Energy Production, Gabriele Centi and Rutger A. van Santen, WILEY-VCH Verlag GmbH & Co.KGaA, Weinheim, **2007**.
    3. Synthesis of Solid Catalysts, Krijn P. de Jong, WILEY-VCH Verlag GmbH & Co.KGaA, Weinheim, **2007**.
    4. Industrial Catalysis: A Practical Approach, Second Edition. Jens Hagen WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim, **2006**, ISBN: 3-527-31144-0.
    5. B. Cornils, W. A. Herrmann, R. Schlögl, C.-H. Wong Catalysis from A to Z A Concise Encyclopedia 2nd ed **2003**, ISBN 3-527-30373-1
    6. Catalytic Air Pollution Control: Commercial Technology, Johnson Matthey PLC, Orchard Road, Royston, Hertfordshire SG8 5HE, UK; **2010**

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

http://en.wikipedia.phys/wiki/Petroleum1
-http://www.chemhelper.com/
- http://www.chemweb.com

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

Microsoft PowerPoint, Microsoft Word
-Videos on the chemistry of surfaces.
- Educational CD for surface Chemistry correlated with other themes

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) **-classroom capacity (30) students.**

2. Computing resources (AV, data show, Smart Board, software, etc.) **Hall equipped with a computer and the Data Show and Television is urgently required**
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) No other requirements

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching **Scheduled to complete the questionnaire calendar in particular.** **- Focus group discussions with small groups of students.**
2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor Feedback and assistance from colleagues. - Independent evaluation of the extent to which students of the standards. - independent advice to the duties and tasks
3 Processes for Improvement of Teaching **Workshops for the teaching methods.** **- Continuous training for the faculty member.** **- Revision of the proposed strategies.** **- The provision of modern tools necessary for learning.** **- Application of the means of e-learning.** **- Exchange of internal and external experiences**
4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) **Checking the samples of test papers, or student work, which has been corrected by a faculty member.** **- Exchange professors from different educational institutions on regular basis to correct samples of**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

Consult with other professors teaches the same subject.

- **Hosting a visiting professor to evaluate the subject.**
- **Workshops for teachers whom teach the same subject.**
- **Periodic review for teachers to modify the negatives contents in the subject**.

Faculty or Teaching Staff: Prof. Dr Abd El Rahman Khedr

Signature: ___________________________________ Date Report Completed: _____2018___________

Received by: ____ Dr. Ismail Althagafi ______ Department Head

Signature: ___________________________________ Date: ________________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Solution Chemistry and Kinetic Theory of Gases

4024576-2
Course Specifications
(CS)

Course Specifications

Institution: **Umm Al-qura University** Date of Report: **2015**

College/Department : **Faculty of Applied Science/ department of chemistry**

A. Course Identification and General Information

1. Course title and code: **Solution Chemistry and Kinetic Theory of gases 4024576-2**
2. Credit hours: **2 (theoretical)**
3. Program(s) in which the course is offered. **Chemistry**
4. Name of faculty member responsible for the course: **Professor MetwallyAbdallah**
5. Level/year at which this course is offered: **4rd level/1st year**
6. Pre-requisites for this course (if any): **-**
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **both on El-Abedyah and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ☒ What percentage? 100%

b**. Blended (traditional and online)** What percentage?

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage? ☐

Comments:

B Objectives

1. What is the main purpose for this course? **By the end of this course student will be familiar** 1. describe the fundamental principles of solution chemistry. 2. State the fundamental of different types of solutions. 3. Develop the conductivity and ionic strength of solutions. 4. known the **Vant Hoff factor and Debye theory and movement** **5-Stydy the basic concepts of chemistry of electrolytic solutions , diffusion of gases**
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material l, changes in content as a result of new research in the field) **1-The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course** 2- encourage students to make reports in the recent trends in the field of solutions chemistry, either from the library or by using the Internet.

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Introduction on the solutions ,types of solutions (Ideal and non ideal Solutions)	1	2
Colligative properties of solutions	1	2
RElectrolytic solutions ,Faradays law,Electrochemical equivaslent .	1	2
Electrical conductance applications and Kolwrawsh Law	1	2
Conductometirc titrations	1	2
Transport numbers and ionic migration and Oswald Law Strong	1	2
Activity ,activity coefficient and ionic strength	1	2
Mid term	1	2

Strong electrolytes theories (Arrhenius, Dubby Huckel)	1	2
Kinetic theory of gases and its applications	1	2
Collisions between gas molecules – and mean free path and collision diameter	1	2
Molecular velocities, Viscosity of gases Real gases- compressibility factor – Van der Walls Equation	2	4

II-General scheme for identification of organic aliphatic unknown

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	-				28
Credit	2	-				2

3. Additional private study/learning hours expected for students per week. ☐

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	**Course Teaching Strategies**	**Course Assessment Methods**
1.0	**Knowledge**		
1.1	• List the historical development (thinking back) and to acquire student skill training to choose appropriate methods of and gas liquefaction.	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • long and short essays • posters lab manuals
1.2	• **describe the student predicating skill of equivalent conductance at infinite dilution for week electrolyte.**		
1.3	• Illustrate **the values of transport numbers , ionic**		

	strength and distribution of molecular velocities.		
1.4	• **mentionappropriate methods of determination of ionization constant of week electrolyte.**		
1.5	• **Define different ways to determine Vant Hoff factor**		
1.6	• **Explain different ideas for student innovates the studying the deviation of gases**		
1.7	**Describe the student plans of research program in the field of solution chemistry according to organized steps.**		
2.0	**Cognitive Skills**		
2.1	• **Generate dialogue and debate within the classroom.**	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • posters • demonstrations
2.2	• **Examples given in the lecture and exercise under the supervision of teaching workshops.**		
2.3	• **Give some practical issues and assigning students to create a strategic plan for the solution.**		
2.4	• **Encourage the transmission of learning using analysis tools in various applications and through discussion of potential applications in other areas.**		
2.5	**Commissioned student functions duties include open tasks designed to apply the predicating skills, analysis and problem solving.**		
3.0	**Interpersonal Skills & Responsibility**		

3.1	- **Ability to work in teams to conduct some joint reports.**	- Scientific discussion - Web-based study	- web-based student performance systems
3.2	**Development of student opinion of fellow accepts its participation to do effective presentation of the topic was linked to course, and evaluate results to discover the responsiveness of students to collective cooperation.**		
4.0	**Communication, Information Technology, Numerical**		
4.1	- **Use the computer in the compilation of research that helps in writing reports on topics relevant to the course.**	- Lectures - Scientific discussion - Library visits - Web-based study	- web-based student performance systems - individual and group presentations
4.2	- **Use the computer and the Internet to identify sources of recent research relevant to the course**		
5.0	**Psychomotor**		
5.1	NOT APPLICABLE		
5.2			

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	First Periodic Exam.	6	20 %
3	Second Periodic Exam.	12	20 %
4	Final Exam.(2 hours exam)	16	50 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**

- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

P. Atkins**,Physical Chemistry, *9 ed.*** (2014)Published by McGraw Hill Companies,Newyork
2-Raymond Chang, Chemistry ,10th.Edition(2010).
Publisher: Thoma D.Timp

J2-P.Somasundaran, and Dianzuo Wang, Solution Chemistry,Mineral and Reagents,

(2006)Elseiver

3-Alberrty/Sibey, Physical chemistry,1992 , John Willey& Sons.

2. List Essential References Materials (Journal s, Reports, etc.)

- Lecture Hand outs available on the coordinator website

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

- Walter Kauzmann, Kinetic Theory of Gases,**(2012) Dover Publications**

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://en.wikipedia.org/wiki/Petroleum1- http://www.chemhelper.com/**
- **http://www.chemweb.com/**
- **http://www.science.uwaterloo.ca/~cchieh/cact/**
- **http://www.sciencedirect.com/**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)
   - **Classrooms capacity (30) students.**
   - **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

- **Room equipped with computer and projector and TV.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

Complete the questionnaire evaluation of the course in particular.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- **Observations and the assistance of colleagues.**
- **Independent evaluation for extent to achieve students the standards.**
- **Iindependent advice of the duties and tasks.**

3 Processes for Improvement of Teaching

- **Workshops for teaching methods.**
- **Continuous training of member staff.**
- **Review of strategies proposed.**
- **Providing new tools for learning.**
- **The application of e-learning.**
- **Eexchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: **Professor Metwally Abdallah**

Signature: **Date Report Completed: 2018**

Received by: Dr. Ismail Althagafi Department Head

Signature: _________________________________ Date: ________________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Molecular Spectroscopy

4024577-2

Course Specifications
(CS)

Course Specifications

Institution **Umm Al-qura University** Date of Report: **2016**

College/Department **Faculty of Applied Science/ Department of chemistry**

A. Course Identification and General Information

1. Course title and code: **Molecular Spectroscopy - 4024577-2**
2. Credit hours: 2 h (**theoretical**)
3. Program(s) in which the course is offered. **Chemistry**
4. Name of faculty member responsible for the course: **Ahmed Mohamed El Defrawy**
5. Level/year at which this course is offered: **7th level/fourth Year**
6. Pre-requisites for this course (if any): **Quantum Chemistry**
7. Co-requisites for this course (if any): **none**
8. Location if not on main campus: : **both on El-Abedyah and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ☒ What percentage? 100%

b. Blended (traditional and online) ☐ What percentage? ☐

c. e-learning What percentage?

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage? ☐

Comments:

B Objectives

1. What is the main purpose for this course?

By the end of this course student will :

1. describe the fundamental principles of molecular spectroscopy.
2. apply quantitative reasoning and problem-solving skills with quantum chemistry as a context to explain the different types of molecular spectra.
3. develop physical intuition, mathematical reasoning, and problem solving skills.
4. be further prepared for the necessarily rigorous sequence in chemistry courses needed the molecular spectroscopy.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
1- Introduction to molecular structure and electromagnetic radiation	1	2
2- Rotational spectra- Rigid rotor	3	6
3- Vibrational spectra – harmonic oscillator	3	6
4- Electronic spectra	2	4
5- NMR	2	4
6- Molecular symmetry and spectroscopy	3	6

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	**28**	**-**	**-**	**-**		**28**
Credit	**2**	**-**	**-**	**-**		**2**

3. Additional private study/learning hours expected for students per week. **-**

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Recognize the meaning of Electromagnetic radiation	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • portfolios • long and short essays • quizes
1.2	Identify the laws of absorption and emission of radiation.		
1.3	identify the absorption spectra in the microwave and infrared region		
1.4	Name the types of molecules based on the symmetry of their structures x		
1.5	describe how quantum treatment is used to study the rigid rotor and the harmonic oscillator.		
1.6	list the different electronic transition in organic compounds in the UV/Vis region using quantum theory.		
1.7	recognize the absorption spectra in the Radio wave region		
1.8	Recognize classical and qualitative description of the Nuclear magnetic resonance (NMR)		
1.9	Define the symmetry –symmetry elements and different symmetry operations – Point groups – retaliation between		

	the symmetry and spectroscopy and the molecular orbital theory		
2.0	**Cognitive Skills**		
2.1	apply the laws of absorption and emission of radiation for any kinds of radiation	• Scientific discussion • Library visits • Web-based study	• portfolios • final exam • group disscusion
2.2	analyze the spectra of different region of electromagnetic radiation based on quantum chemical aspects.		
2.3	Compare between classical and qualitative description of the Nuclear magnetic resonance (NMR)		
2.4	Apply the symmetry elements and operation on different compounds		
3.0	**Interpersonal Skills & Responsibility**		
3.1	Manage resources, time and collaborate with members of the group.	1. Team work groups for cooperative work making. 2. Presenting the analysis and interpretation of a case study for each group to the other groups in class. 3.Open a general discussion with students in the area of educational issues for knowledge transfer between the students.	1.Writing group scientific report for a case study. 2.Assessment of the solution of problems submitted by the students
3.2	Use university library and web search engines for collecting information and search about different topics .		
4.0	**Communication, Information Technology, Numerical**		
4.1	Work effectively both in a team, and independently on solving chemistry problems.	1.Write a Report 2.Use digital libraries and/or E-Learning Systems for the communication with lecturer through the course work	1. Evaluating the activities of the students through the semester for their activities on the E-learning system, as well as, their communication with each other in different tasks. 2.Evaluation of the report presented
4.2	Communicate effectively with his lecturer and colleagues		
4.3	Use IT and web search engines for collecting information**.**		
5.0	**Psychomotor**		
5.1	NOT APPLICABLE		

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	First Periodic Exam.	6	20 %
3	Second Periodic Exam.	12	20 %
4	Final Exam.(2 hours exam)	16	50 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

- I.N. Levine, Molecular Spectroscopy, Wiley Interscience, New York, 1975.

2. List Essential References Materials (Journals, Reports, etc.)

- **W. J. Moore, Physical Chemistry, 5th edition, Longman, 1972.**

- K. Anderson, Fundamental of Molecular Spectroscopy, John Wiley& Sons, 3rd Edition, 1992.

- J. Michael Hollas, Modern Spectroscopy, 4th ed. John, Wiley & Sons New York, 2004.

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

none

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com**
- **http://www.sciencedirect.com**
- **http://www.rsc.org**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- **Classrooms capacity (30) students.**
- **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

- **Room equipped with computer and projector and TV.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

Complete the questionnaire evaluation of the course in particular.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- **Observations and the assistance of colleagues.**
- **Independent evaluation for extent to achieve students the standards.**
- **Iindependent advice of the duties and tasks.**

3 Processes for Improvement of Teaching

- **Workshops for teaching methods.**
- **Continuous training of member staff.**
- **Review of strategies proposed.**
- **Providing new tools for learning.**
- **Application of e-learning.**
- **Eexchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: Ahmed Mohamed El Defrawy

Signature: **Date Report Completed: 2018**

Received by: Dr. Ismail Althagafi **Dean/Department Head**

Signature: ______________________________ **Date: ______________**

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specifications
(CS)

Nanochemistry

4024584-2

Course Specifications

Institution **Umm Al-Qura University** Date of Report

College/Department /**Applied Science /Chemistry Department**

A. Course Identification and General Information

1. Course title and code: **Nanochemistry / 4024584-2**
2. Credit hours: 2 (theoretical)
3. Program(s) in which the course is offered. chemistry
(If general elective available in many programs indicate this rather than list programs)
4. Name of faculty member responsible for the course: **Prof. Dr Abd El Rahman Khedr**
5. Level/year at which this course is offered: 8/4th
6. Pre-requisites for this course (if any) surface chemistry
7. Co-requisites for this course (if any)
8. Location if not on main campus: **both on El-Abedyah and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ☒ What percentage? 100%

b. Blended (traditional and online) What percentage? ☐

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage? ☐

Comments:

B Objectives

1. What is the main purpose for this course? Make the students acquainted to the basic concept of nanochemistry and changes of chemical and physical properties due size reduction, and the terminology related to science, nanomaterials and nanotechnology. The students will study the methods of nanoparticle preparation, the most recent tools of nanomaterials characterization, the applications and fictionalization of nanomaterials.
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) **The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course.**

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
General introduction and history of nanotechnology. Importance of the nanoparticles in industries and in our lives.	3	6
Approaches in nanotechnology and typical syntheses of nanoparticles. Properties of nanomaterials, chemical and physical property. Reasons for changing the properties.	2	4
Classification of nanostructured and the chemical and physical properties of different nanostructured. Carbon Based Nanomaterials (Fullerenes, carbon-nanotubes and graphene)	3	6
exam	1	2
▪ Nanomaterial based catalysts (inorganic nano materials, metal oxide supports, supported nano metal catalysts). ▪ Methods of preparation of nano-formulations and mesoporous materials	2	4

▪ Nanoparticle synthesis and fixtures nanoparticles and **nanocolloids**: Basic synthesis and fabrication methods for nanomaterials (CVD, impregnation, sol-gel, microemulsion, template, hydrothermal) titanium nanotubes with and without palladium, silver and gold nanoparticles and some other fixtures ▪ Spectroscopic and microscopic tools used in nanomaterials characterizations	2	4
▪ General industrial applications for nanoscale systems and fixtures, nano-optic applications, bio-nanotechnology applications and medical nanotechnology applications ▪ Nanotechnology and clean technologies: What is a clean technology challenges facing us in the areas of energy, water and environment, exploring the contribution of nanotechnology to solve these problems, the current obstacles faced by nanotechnology.	2	4
Final exam	1	2

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28					28
Credit	2					2

3. Additional private study/learning hours expected for students per week.2hr

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	**Course Teaching Strategies**	**Course Assessment Methods**
1.0	**Knowledge**		
1.1	Recognize the methods of nanoparticles preparation	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems
1.2	Name the some applications of nanomaterials in industry		

2.0	**Cognitive Skills**		
2.1	Compare between properties of nanomaterials	• Scientific discussion • Library visits • Web-based study	• web-based student performance systems exams
2.2	Compare between methods of characterization of nanomaterials		
3.0	**Interpersonal Skills & Responsibility**		
	• Ability to communicate results of work to classmates. • Ability to work in a team to perform a specific task.	• Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
4.0	**Communication, Information Technology, Numerical**		
	• Interpret the results of characterization tools • Encourage students to use internet for searching certain electronic journals regarding topics of the course. • Scientific writing.	• Scientific discussion • Library visits	• web-based student performance systems • individual and group presentations
5.0	**Psychomotor**		
5.1	NOT APPLICABLE		
5.2			

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	First Periodic Exam.	6	20 %
3	Second Periodic Exam.	12	20 %
4	Final Exam.(2 hours exam)	16	50 %

5	**Total**	**100 %**

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- Presence of faculty members to provide consulting and advice.
- Office hours: during the working hours weekly, and the creation of appropriate means.

E. Learning Resources

1. List Required Textbooks
   1. Nanochemistry. G.B. Sergeev, K.J. Klabunde, Elsevier, **2013**, ISBN: 978-0-444-59397-9
   2. Introduction to Nanoscience and Nanotechnology, Gabor L. Hornyak, H.F. Tibbals, Joydeep Dutta, John J. Moore, CRC Press. Copyright, **2009**.
   3. Nanomaterials and Nanochemistry, C. Bréchignac, P. Houdy, M. Lahmani, Springer Science & Business Media. Copyright, **2006**.
   4. “Nanochemistry, A Chemical Approach to Nanomaterials”, G. Ozin and A. Arsenault, RSC (Royal Society of Chemistry), **2005**.
   5. “Nanostructures and Nanomaterials”, G. Cao, Imperial College Press, **2004**
   6. Nanotechnology: Nanomaterials and Nanodevices, G. Mohan Kumar, Alpha Science International Ltd. **2015**

2. List Essential References Materials (Journals, Reports, etc.)

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)
   1. Nanochemistry. G.B. Sergeev, K.J. Klabunde, Elsevier, **2013**, ISBN: 978-0-444-59397-9
   2. Introduction to Nanoscience and Nanotechnology, Gabor L. Hornyak, H.F. Tibbals, Joydeep Dutta, John J. Moore, CRC Press. Copyright, **2009**.
   3. Nanomaterials and Nanochemistry, C. Bréchignac, P. Houdy, M. Lahmani, Springer Science & Business Media. Copyright, **2006**.
   4. “Nanochemistry, A Chemical Approach to Nanomaterials”, G. Ozin and A. Arsenault, RSC (Royal Society of Chemistry), **2005**.
   5. “Nanostructures and Nanomaterials”, G. Cao, Imperial College Press, **2004**
   6. Nanotechnology: Nanomaterials and Nanodevices, G. Mohan Kumar, Alpha Science International Ltd. **2015**

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

-http://en.wikipedia.phys/wiki/Petroleum1
-http://www.chemhelper.com/
- http://www.chemweb.com/

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software. **Microsoft PowerPoint, Microsoft Word** **-Videos on the chemistry of surfaces.** **- Educational CD for surface Chemistry correlated with other themes**

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) **-classroom capacity (30) students.**

2. Computing resources (AV, data show, Smart Board, software, etc.) **Hall equipped with a computer and the Data Show and Television is urgently required**
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) **No other requirements**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching **Scheduled to complete the questionnaire calendar in particular.** **- Focus group discussions with small groups of students.**
2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor **Feedback and assistance from colleagues.** **- Independent evaluation of the extent to which students of the standards.** **- independent advice to the duties and tasks**
3 Processes for Improvement of Teaching **Workshops for the teaching methods.** **- Continuous training for the faculty member.** **- Revision of the proposed strategies.** **- The provision of modern tools necessary for learning.** **- Application of the means of e-learning.** **- Exchange of internal and external experiences**
4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) **Checking the samples of test papers, or student work, which has been corrected by a faculty member.** **- Exchange professors from different educational institutions on regular basis to correct samples of test papers**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

Consult with other professors teaches the same subject.
- Hosting a visiting professor to evaluate the subject.
- Workshops for teachers whom teach the same subject.
- Periodic review for teachers to modify the negatives contents in the subject.

Faculty or Teaching Staff: Prof. Dr Abd El Rahman Khedr
Signature: ________________________________ Date Report Completed: ____2018__________

Received by: ___ Dr. Ismail Althagafi ____ Dean/Department Head

Signature: ________________________________ Date: _______________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Chemistry of Energy Resources

4024585-2

Course Specifications

Institution **Umm Al-Qura University** Date of Report

College/Department **Applied Science /Chemistry Department**

A. Course Identification and General Information

1. Course title and code: **Chemistry of Energy Resources/4024585-2**

2. Credit hours: **2 h (theoretical)**

3. Program(s) in which the course is offered.
(If general elective available in many programs indicate this rather than list programs)
Chemistry

4. Name of faculty member responsible for the course: **prof. Mohamed Ismail Mohamed Awad**

5. Level/year at which this course is offered
8th Level-Fourth year

6. Pre-requisites for this course (if any)
Electrochemistry- 4022143-3

7. Co-requisites for this course (if any)

8. Location if not on main campus: **both on El-Abedyah and El-Zaher**

9. Mode of Instruction (mark all that apply)

a. Traditional classroom ■ What percentage? 100 %

b. Blended (traditional and online) ☐ What percentage? ☐

c. e-learning What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other What percentage? ☐

Comments:

B Objectives

What is the main purpose for this course? • **Students know renewable energy resources as alternative sources for finite sources.** • **To understand and analyze the present and future energy demand of world and nation regarding the available renewable energy resources such as, solar and nuclear energy.** • **Students familiar with Nuclear chemistry including terminology, Radioactivity and the nature of atoms, Radioactive Decay modes, Radioactive Decay Kinetics and nuclear reactions.** • **Brief introduction on fundamentals of solar energy and photovoltaic cells** • **Brief introduction to fuel cells.**
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) • **Using information technology and the Internet to prepare detailed research of everything new in the course.** • **Add lectures to review all new applications in the area of specialization through use of explanatory films and presentations (Video Projector), (power point)** • **Workshops and scientific forums regularly for more information and training.**

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact Hours
• **The main sources of energy** • **Problems associated with the use of conventional energy sources, including fossil fuels, chemistry of fossil foils, with regard to future supply and the environment.**	**1**	**2**
- **Nuclear energy:** o **-The atomic nuclei, atomic structure and composition of nuclei.** - **Nuclear masses and stability of nucleus.**	**2**	**4**

- Radioactive decay processes, alpha, beta and gamma decays.	1	2
- Radioactive decay and growth. - Equations of transformation during nuclear reactions	1	2
First exam	1	2
- Fission, charge and mass distribution. - Radioactive decay, Half-life, First order reaction, Source strength – Alpha, beta, gamma-radiation, x-rays, high-energy particles – Accelerators, Synchrotron	1	2
Solar energy - An overview including principles of photovoltaics, dye sensitized solar cells and photoelectrochemical cells.	1	2
- Solar cells as cost effective alternative - Impact on environment . -	1	2
Second exam -	1	2
Fuel cells: - The working principles of a Fuel Cell.	1	2
- Fuel cells types	1	2
- Polymer Electrolyte Fuel Cell and Direct Methanol Fuel Cells as examples	1	2
Final exam	1	2

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	**28**					28
Credit	2					2

3. Additional private study/learning hours expected for students per week. 2hr

-

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

- **A brief summary of the knowledge or skill the course is intended to develop;**
- **A description of the teaching strategies to be used in the course to develop that knowledge or skill;**
- **The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.**

	NQF Learning Domains And Course Learning Outcomes	**Course Teaching Strategies**	**Course Assessment Methods**
1.0	**Knowledge**		
1.1	**To know types of radiation emitted by radioactive isotopes.**	• **Lectures** • **Scientific discussion** • **Library visits** • **Web-based study**	• **Exams** • **web-based student performance systems** • **portfolios** • **long and short essays** **posters lab manuals**
1.2	**To know the relation between the stability of nucleus from the ratio of neutrons to protons**		
1.3	**To define binding energy**		
1.4	**To know about the energy accompany nuclear reactions**		
1.5	**To mention types of nuclear reactions**		
1.6	**To know instruments for measuring radiation**		
1.7	**To mention some applications of radioactive isotopes in medicine, agriculture …etc.**		

1.8	**To write about types of solar cells**		
1.9	**To mention types of fuel cells**		
2.0	**Cognitive Skills**		
2.1	**To predict the stability of radioactive isotope**	• **Lectures** • **Scientific discussion** • **Library visits** • **Web-based study**	• **web-based student performance systems** • **portfolios** • **posters** **demonstrations**
2.2	**To compare types of nuclear reaction**		
2.3	**To compare the types of radioactive emissions**		
2.4	**To differentiate between solar cells**		
2.5	**To compare Fuel cells**		
3.0	**Interpersonal Skills & Responsibility**		
3.1	**The ability for teamwork and the distribution of tasks.**	- **Scientific discussion** -	- **web-based student performance systems**
3.2			
4.0	**Communication, Information Technology, Numerical**		
4.1	- **The ability to debate and dialogue with clear scientific method.**	- Lectures - Scientific discussion - Library visits - Web-based study	- web-based student performance systems - individual and group presentations
4.2	**The ability to present or explain scientific topic.**		
5.0	**Psychomotor** NOT APPLICABLE		
5.1			
5.2			

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	First Periodic Exam.	6	20 %
3	Second Periodic Exam.	12	20 %
4	Final Exam.(2 hours exam)	16	50 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

- **Textbook of Nuclear Chemistry, A. Singh, R. Singh, Campus Publishers, 2006**
- **Applied Photovoltaics, Stuart Wenham, Martin Green, and Muriel Watt, Earthscan, 2007, ISBN 1- 84407-407-3**
- **Fuel cells: problems and solutions, Vladimir S. Bagotsky, Second Edition, John Wiley & Sons, 2012.**

2. List Essential References Materials (Journals, Reports, etc.)

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com**
- **http://www.sciencedirect.com**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- **Classrooms capacity (30) students.**
- **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

- **Room equipped with computer and projector.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching
Complete the questionnaire evaluation of the course in particular.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- **Observations and the assistance of colleagues.**
- **Independent evaluation for extent to achieve students the standards.**
- **Iindependent advice of the duties and tasks.**

3 Processes for Improvement of Teaching

- **Workshops for teaching methods.**
- **Continuous training of member staff.**
- **Review of strategies proposed.**
- **Providing new tools for learning.**
- **The application of e-learning.**
- **Eexchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: Mohamed Ismail Mohamed Awad

Signature: _________________________________ Date Report Completed: ____2018___________

Received by: ____ Dr. Ismail Althagafi ____ Dean/Department Head

Signature: _________________________________ Date: _______________

B- Inorganic Chemistry Courses

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

General Chemistry 2

4022131-2

Course Specifications

(CS)

1436/1437 H

2015/2016 AD

Course Specifications

Institution: **Umm Al-Qura University** Date of Report: **2015**

College/Department : **Faculty of Applied Sciences / Chemistry Department**

A. Course Identification and General Information

1. Course title and code: **General Chemistry 2/ 4022131-2**
2. Credit hours: 2 **(theoretical)**
3. Program(s) in which the course is offered: **Chemistry**
4. Name of faculty member responsible for the course: **Dr. Mona Alhasani**
5. Level/year at which this course is offered: **3rd level/2nd year**
6. Pre-requisites for this course (if any): **-** General Chemistry 1
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **both on El-Abedyah and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ☒ What percentage? **100%**

b**. Blended (traditional and online)** What percentage?

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage? ☐

Comments:

B. Objectives

1. What is the main purpose for this course? By finishing of this course, the students will be able to discuss and explain: a. The atomic shells, their shapes and Bohr theory of hydrogen atom. b. Electronic structure and Lewis structures of different chemical compounds. c. The valence shell electron pairs repulsion theory, molecular orbital theory and valence bond theory. **d.** The principle quantum numbers, classification of elements and properties of ionic and covalent compounds.
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) • Using different learning sources of the course, so that the students make use of more than one reference. • The use of smart teaching halls for lectures. • Encourage students to carry out reports in the field of general chemistry.

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached):

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
• Electronic structure – atomic shells and their shapes.	**1**	**2**
• Bohr theory of hydrogen atom.	**1**	**2**
• Principle quantum numbers.	**1**	**2**
• Properties of elements and the periodic table – classification of elements into periods and groups.	**1**	**2**

• Comparison between some properties of the elements inside the period such as; ionization energy, electron affinity, electronegativity and atomic size.	**2**	**4**
• Chemical bonds; their types and theories – Lewis symbols and structures.	**1**	**2**
• Valence shell electron pairs repulsion theory.	**1**	**2**
• Valence bond theory.	**1**	**2**
• Hybridization and its types	**2**	**4**
• Molecular orbital theory – octet rule.	**2**	**4**
• Properties of ionic and covalent compounds.	**1**	**2**

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	-		-		28
Credit	2	-		-		2

3. Additional private study/learning hours expected for students per week.

- Student spends 10 hrs in preparing reports related to general chemistry and their discussions.

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	**Course Teaching Strategies**	**Course Assessment Methods**
1.0	**Knowledge**		
1.1	Describe the atomic shells and their shapes.	• Lectures	• Written mid-term and

1.2	Write on classification of elements into periods and groups.	• Scientific discussion • Use the library to work duties and a small research on general chemistry. • Use of the Internet to carry out some reports on course subjects.	final exams • Long and short essays.
1.3	List the properties of the elements inside the periods and groups.		
1.4	Memorize the valence shell electron pairs repulsion theory.		
1.5	Describe Bohr theory of hydrogen atom.		
2.0	**Cognitive Skills**		
2.1	Predict the type of hybridization in a chemical compounds.	• Lectures • Scientific discussion • Library visits • Web-based study	• Periodic tests and assignments. • Measuring the response to the assignments.
2.2	Explain Lewis structures of different chemical compounds.		
2.3	Compare between molecular orbital theory and valence bond theory.		
2.4	Estimate the principle quantum numbers of different chemical compounds.		
3.0	**Interpersonal Skills & Responsibility**		
3.1		• Dividing students into groups to carry out collective scientific reports. • Periodic	• Evaluate the results of collective works and duties as well as knowing the contribution of each individual through
3.2	Develop the student's ability in self-reliance and responsibility.		
3.3	Operate in team work and accept his college's opinions.		

		individual duties to develop the skill of taking responsibility and self-reliance	dialogue and discussion. • Assessment of individual tasks and duties to determine the student's ability to self-reliance.
4.0	**Communication, Information Technology, Numerical**		
4.1	Use computers and the international information network (the Internet) to perform calculations and to identify recent research relevant to decision sources.	• Visiting research centers. • The use of computers in the training room of the department. • Using the internet for collecting data.	• Evaluation of the duties associated with the proper use of numerical and communication skills. • Web-based student performance systems • Individual and group presentations.
4.2	Perform mathematical calculations and data analysis.		
5.0	**Psychomotor**		
5.1	• Not applicable.		
5.2			

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	First Periodic Exam.	6	20 %
3	Second Periodic Exam.	12	20 %
4	Final Exam.(2 hours exam)	16	50 %

5	**Total**	**100 %**

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- Office hours: During the working hours weekly.
- Academic Advising for students.
- Availability of Staff members to provide counseling and advice.

E. Learning Resources

1. List Required Textbooks

- General Chemistry: The Essential Concepts 7th Edition by Raymond Chang Dr., Kenneth Goldsby Professor, 2013.

2. List Essential References Materials (Journals, Reports, etc.)

- D. A. McQuarrie, J. D. Simon. Physical Chemistry: A Molecular Approach. University Science Books, 1997.
- J. D. Lee, Concise Inorganic Chemistry, 5th ed., Wiley-Blackwell, 1998.

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

- Inorganic Chemistry Catherine Housecroft and Alan G. Sharpe, 4th ed. Pearson, 2012.
- H. B. Gray. Chemical Bonds: An Introduction to Atomic and Molecular Structure, University Science Books, 1994.

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- http://www.chemweb.com
- http://www.sciencedirect.com
- http://www.rsc.org

- 5. Other learning material such as computer-based programs/CD, professional standards or regulations and software. : **- Not required.**

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- Equipped lecture halls.

2. Computing resources (AV, data show, Smart Board, software, etc.)

- Room equipped with computer, data show and TV.

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- No other requirements.

G. Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Questionnaire evaluation of the course each semester.

2. Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- Preparation of a course report and study of the results of the students to give us indication about the planned outputs and the extent to which student's benefits.

3. Processes for Improvement of Teaching

- Exchange of experiences internal and external.
- Application of e-learning.
- Review of strategies proposed.
- Providing new tools for learning.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- Check marking of a sample of exam papers, or student work.

- Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.

5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- Consulting other staff of the course.
- Hosting a visiting staff to evaluate of the course.
- Workshops for teachers of the course.
- Periodic review of the contents of the syllabus and modify the negatives.

Faculty or Teaching Staff: **Dr. Mona Alhasani**

Signature: **Date Report Completed: 29/11/2015**

Received by: Dr. Ismail Althagafi **Department Head**

Signature: **Date: _______________**

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Chemistry of the Main Group Elements

4022141-2
Course Specifications
(CS)

1436/1437 H

2015/2016 AD

Course Specifications

Institution: **Umm Al-qura University** Date of Report: **2015**

College/Department : **Faculty of Applied Sciences/ Department of Chemistry**

A. Course Identification and General Information

1. Course title and code: **Chemistry of the Main Group Elements / 4022141-2**
2. Credit hours: **2** hours (**theoretical**)
3. Program(s) in which the course is offered. **Chemistry**
4. Name of faculty member responsible for the course: **Dr. Mona Alhasani**
5. Level/year at which this course is offered: **4th level/2nd year**
6. Pre-requisites for this course (if any): General Chemistry 2
7. Co-requisites for this course (if any): -
8. Location if not on main campus: **both on El-Abedyah and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom	☒	What percentage? **100%**	
b**. Blended (traditional and online)**		What percentage?	
c. e-learning	☐	What percentage?	☐
d. Correspondence	☐	What percentage?	☐
f. Other	☐	What percentage?	☐

Comments:

B Objectives

1. What is the main purpose for this course?

By the end of this course, the student should fully aware of:

a. The main group elements in the periodic table.

b. The chemical properties of the main group elements through their reactions.

c. The existence and most important compounds of the main group elements.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

- Encourage students to carry out reports in the field of chemistry of main group elements.
- Using different learning sources of the course, so that the students make use of more than one reference.
- The use of smart teaching halls for lectures.

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
• General and periodic properties of main group (non-transition) elements; electronic structure, size, electron affinity, ionization, electronegativity & electropositivity and oxidation states.	2	4
• Horizontal, perpendicular and diagonal relationships in periodic table	1	2
• Hydrogen and its position & properties, its isotopes and chemical properties.	1	2
• s-bolck elements; electronic configuration, size, hardness, melting points – chemical properties; chemical reactivity with metals, nitrogen, acids, complexes formation – solubility and hydration – solubility in ammonia	3	6
• Halides – some chemical properties of lithium and magnesium – diagonal relationship between lithium and magnesium elements.	1	2
• Chemical properties of beryllium and differences between it and second group elements – diagonal relationship between beryllium and aluminum.	1	2

• p-block elements; their electronic configuration, properties and their compounds – properties of the first element in each group and compare it with the last element – inert pair effect –metallic and non-metallic properties of groups.	3	6
• Independent study of the third, fourth, fifth, sixth, seventh and inert gases groups.	2	4

II-General scheme for identification of organic aliphatic unknown

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	-		-		28
Credit	2	-		-		2

3. Additional private study/learning hours expected for students per week.

- Each student spends 2 hrs each weak in preparing reports and their discussions.

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy.

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Know the general and periodic properties of main group (non-transition) elements including their atomic and ionic size, ionization potential, electron affinity, electro-negativity and physical properties.	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios
1.2	Recognize the horizontal, perpendicular and diagonal relationships in periodic table		
1.3	List the chemical properties of hydrogen and its isotopes.		
1.4	Define s-bolck elements and recognize their properties.		
1.5	Describe halides and state some chemical properties of lithium and magnesium and definition of the diagonal relationship between lithium and magnesium.		
1.6	Recall ord the chemical properties of beryllium and recognize the differences between it and second group		

	elements		
1.7	Define the p-bolck elements and recognize their properties.		
1.8	Remember the third, fourth, fifth, sixth, seventh and inert gases groups.		
2.0	**Cognitive Skills**		
2.1	Summarize the general and periodic properties of main group (non-transition) elements including their atomic and ionic size, ionization potential, electron affinity, electro-negativity and physical properties.	• Lectures • Scientific discussion • Library visits • Web-based study	• Periodic and final exams. • Web-based student performance systems. • Reports.
2.2	Compare between the horizontal, perpendicular and diagonal relationships in periodic table		
2.3	Interpret the chemical properties of s-bolck elements.		
2.4	Evaluate the diagonal relationship between lithium and magnesium.		
2.5	Compare between beryllium and second group elements		
2.6	Define the chemical properties of p-bolck elements.		
3.0	**Interpersonal Skills & Responsibility**		
3.1			
3.2			
4.0	**Communication, Information Technology, Numerical**		
	• Evaluate the general properties of the periodic table • Interpret the chemical and physical properties of the groups of s and p-blocks. • Use information and communication technology. • The ability to use e-mail to communicate with the instructor and other students. • Scientific writing. • Use his/her observations to solve problems.	• Lectures • Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
5.0	**Psychomotor**		
5.1	NOT APPLICABLE		
5.2			

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment

1	Homework or activities.	--	10 %
2	First Periodic Exam.	6	20 %
3	Second Periodic Exam.	12	20 %
4	Final Exam.(2 hours exam)	16	50 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- Office hours: During the working hours weekly.
- Academic advising for students.
- Availability of staff members to provide counselling and advice.

E. Learning Resources

1. List Required Textbooks
   - A. G. Massey, Main Group Chemistry, 2nd Edition, Wiley, 2000.
2. List Essential References Materials (Journals, Reports, etc.)
   - Das, Kumar V.G, Main Group Elements and their Compounds, Springer, 1996.
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)
   - F. A. Cotton and G. Wilkinson, Advanced Inorganic Chemistry, A comprehensive text, 1988, John Wiley & Sons.
4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)
   - **http://www.chemweb.com**
   - **http://www.sciencedirect.com**
   - **http://www.rsc.org**
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- **Classrooms capacity (30) students.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

- Rooms equipped with computers and projectors.

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- **No other requirements.**

G. Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Questionnaire evaluation of the course in particular.

2 . Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- Preparation of a course report and study of the results of the students to give us indication about the planned outputs and the extent to which student's benefits.

3. Processes for Improvement of Teaching

- Application of e-learning.
- Exchange of experiences internal and external.
- Review of strategies proposed.
- Providing new tools for learning.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- Check marking of a sample of exam papers, or student work.
- Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- Periodic Review of the contents of the syllabus and modify the negatives.
- Consult other staff of the course.
- Hosting a visiting staff to evaluate of the course.
- Workshops for teachers of the course.

Faculty or Teaching Staff: **Dr. Mona Alhasani**

Signature: **Date Report Completed: 2018**

Received by: Dr. Ismail Althagafi **Department Head**

Signature: ________________________________ **Date: _______________**

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Chemistry of Transition Elements

4023552-2

Course Specifications

(CS)

1436/1437 H

2015/2016 AD

Course Specifications

Institution: **Umm Al-qura University** Date of Report: **2015**

College/Department : **Faculty of Applied Science/ Department of Chemistry**

A. Course Identification and General Information

1. Course title and code: **Chemistry of Transition Elements / 4023552-2**

2. Credit hours: **2 (theoretical)**

3. Program(s) in which the course is offered: **Chemistry**

4. Name of faculty member responsible for the course: **Dr. Hoda El-Ghamry**

5. Level/year at which this course is offered: **5th level/3th year**

6. Pre-requisites for this course (if any): **Chemistry of the Main Group Elements**

7. Co-requisites for this course (if any): -

8. Location if not on main campus: **both on El-Abedyah and El-Zaher**

9. Mode of Instruction (mark all that apply)

a. Traditional classroom ☒ What percentage? **100%**

b. **Blended (traditional and online)** What percentage?

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage? ☐

Comments:

B. Objectives

1. What is the main purpose for this course? By the end of this course student will be familiar with: a. The properties of the main transition elements. b. The properties of the inner transition elements depending on the periodic properties in the periodic table in addition to a comparative studies of the elements in their groups. c. The spectroscopic and magnetic properties of the transition elements.
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) • Encourage students to carry out reports in the field of chemistry of transition elements. • Using different learning sources of the course, so that the students make use of more than one reference. • The use of smart teaching halls for lectures.

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
• The site transition elements in the periodic table.	1	2
• d-block elements, first transition series (3d), second transition series (4d) and third transition series (5d).	2	4
• f-block elements: lanthanides series (4f) and actinides series (5f).	1	2
• Differences between d-block and f-block elements.	1	2
• Comparisons between 4d and s, p block elements.	1	2
• Characteristic properties of first transition series.	1	2
• Magnetic properties from crystal field theory.	1	2

• Electronic distribution of electrons in d orbitals on octahedral complexes.	1	2
• Comparison between the properties of first transition series (3d) with the second transition series (4d) and third transition series (5d).	1	2
• Comparative studies of transition elements in their groups; scandium group, titanium group, vanadium group, chromium group, manganese group, iron, cobalt & nickel groups, copper group, and zinc group.	2	4
• f-block elements: studies of lanthanides and actinides in comparison with scandium group in terms of abundance, electronic configuration, oxidation states and lanthanides contraction.	1	2
• Spectroscopic and magnetic properties – difference between 4f and 5f and its effect on chemical behavior.	1	2

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	-		-		28
Credit	2	-				2

3. Additional private study/learning hours expected for students per week.

- Each student spends 2 hrs each weak in preparing reports and their discussions.

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Describe the site of transition elements in the periodic table.	• Lectures • Scientific discussion • Library visits • Web-based study	• Periodic and final exams. • Web-based student performance systems. • Reports.
1.2	Recall d-block elements		
1.3	Know the f-block elements by its two series; lanthanides (4f) and actinides (5f).		
1.4	Describe the characteristic properties of first transition series.		
1.5	Identify the magnetic properties from crystal field theory.		
1.6	Recognize the electronic distribution of electrons in d orbitals on octahedral complexes.		
1.7	Remember the transition elements in their groups; scandium group, titanium group, vanadium group, chromium group, manganese group, iron group, cobalt group, nickel group, copper group, and zinc group.		
1.8	List lanthanides and actinides (f-block elements) in comparison with scandium group (abundance, electronic configuration, oxidation states and lanthanides contraction).		
1.9	Recognize the spectroscopic and magnetic properties of the d- and f-block elements		
2.0	**Cognitive Skills**		
2.1	Explain the site of transition elements in the periodic table.	• Lectures	• Periodic and

2.2	Compare between d-block and f-block elements.	• Scientific discussion • Library visits • Web-based study	final exams. • Web-based student performance systems. • Reports.
2.3	Differentiate between d-block elements with s & p block elements.		
2.4	Clarify the characteristic properties of first transition series.		
2.5	Compare between the properties of first transition series (3d) with the second transition series (4d) and third transition series (5d).		
2.6	Subdivide the f-block elements into lanthanides and actinides and compare them with scandium group (abundance, electronic configuration, oxidation states and lanthanides contraction)		
2.7	Predict the spectroscopic and magnetic properties of the d- and f-block elements		
3.0	**Interpersonal Skills & Responsibility**		
• Ability to communicate results of work to classmates. Ability to work in a team to perform a specific task.		• Scientific discussion • Web-based study	• Web-based student performance systems.
4.0	**Communication, Information Technology, Numerical**		
• Predict the site of the transition elements in the periodic table. • Interpret the properties of the transition elements in their groups including scandium group, titanium group, vanadium group, chromium group, manganese group, iron group, cobalt group, nickel group, copper group, and zinc group. • Enhancing the ability of students to use computers and internet.		• Lectures • Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations

	• Interpret chemical data • Present chemical data orally. • Know how to write a report.		
5.0	**Psychomotor**		
5.1	NOT APPLICABLE		
5.2			

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	First Periodic Exam.	6	20 %
3	Second Periodic Exam.	12	20 %
4	Final Exam.(2 hours exam)	16	50 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- Office hours: During the working hours weekly.
- Academic Advising for students.
- Availability of Staff members to provide counselling and advice.

E. Learning Resources

2. List Essential References Materials (Journals, Reports, etc.)

- Lecture hand outs available on the coordinator website

1. List Required Textbooks

- R. Gopalan " *Textbook of Inorganic Chemistry 1st Edition"* **2011,** *CRC Press*.

- T. W. Graham Solomons, Craig B. Fryhle, Scott A. Snyder "*Organic Chemistry, 11th Edition, International Student Version*" **2013**, John Wiley & Sons.

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

- Amit Arora "*Introductory Organic Chemistry*" **2006**, Discovery Publishing House New Delhi
- Eleanor Crabb, Elaine Moore, Lesley Smart "*Concepts in Transition Metal Chemistry*" **2010**, Royal Society of Chemistry.
- Kazuo Nakamoto "Infrared and Raman Spectra of Inorganic and Coordination Compounds" **2009,** John Wiley &Sons.

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com**
- **http://www.sciencedirect.com**
- **http://www.rsc.org**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software: None

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- Classrooms capacity (30) students.

2. Computing resources (AV, data show, Smart Board, software, etc.)

- Room equipped with computers and projectors**.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- No other requirements.

G. Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Questionnaire evaluation of the course in particular.

2 . Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- Preparation of a course report and study of the results of the students to give us indication about the planned outputs and the extent to which student's benefits.

3. Processes for Improvement of Teaching

- Application of e-learning.
- Exchange of experiences internal and external.
- Review of strategies proposed.
- Providing new tools for learning.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- Check marking of a sample of exam papers, or student work.
- Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- Periodic Review of the contents of the syllabus and modify the negatives.
- Consult other staff of the course.
- Hosting a visiting staff to evaluate of the course.
- Workshops for teachers of the course.

Faculty or Teaching Staff: Dr. Hoda El-Ghamry

Signature: Date Report Completed: 2018

Received by: Dr. Ismail Althagafi Department Head

Signature: ________________________________ Date: _______________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Coordination Chemistry

4023564-3

Course Specifications

(CS)

1436/1437 H

2015/2016 AD

Course Specifications

Institution: **Umm Al-qura University** Date of Report: **2015**

College/Department : **Faculty of Applied Sciences / Chemistry Department**

A. Course Identification and General Information

1. Course title and code: **Coordination Chemistry / 4023564-3**
2. Credit hours: **3 (2 theoretical +1 practical)**
3. Program(s) in which the course is offered: **Chemistry**
4. Name of faculty member responsible for the course: **Prof. Abdalla Mohamed Khedr**
5. Level/year at which this course is offered: 6th **level/3rd year**
6. Pre-requisites for this course (if any): **-** Chemistry of Transition Elements
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **both on El-Abedyah and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ☒ What percentage? 100%

b. Blended (traditional and online) What percentage? ☐

c. e-learning ☐ What percentage?

d. Correspondence ☐ What percentage?

f. Other What percentage? ☐

Comments:

B. Objectives

1. What is the main purpose for this course?

By ending this course, students should be familiar with:

a. The nature, types, naming and importance of coordination compounds.

b. The different theories explaining the bonding in metal complexes.

c. The preparation methods of coordination compounds.

d. The spectral, magnetic and biological properties of metal complexes.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

- Using different learning sources of the course, so that the students make use of more than one reference.
- Encourage students to carry out reports in the field of coordination chemistry including preparation and study of some physical and chemical properties and link the practical side with the theoretical one in order to understand the nature of coordination compounds.
- The use of smart teaching halls for lectures.

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached):

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
• Introduction to the chemistry of coordination compounds - Werner theory of coordination compounds - Effective atomic number.	2	4
• Ligands – nomenclature of metal complexes – symmetry in metal complexes.	1	2

• Valence bond theory – coordination numbers and geometrical structures – inner and outer complexes.	2	4
• Stability of metal complexes; factors affecting the stability of metal complexes – ionic and ionization potential – geometrical arrangement of ligands around the central metal ion - metal chelates.	2	4
• Crystal field theory; ligand field in octahedral complexes – ligand field in tetrahedral complexes – ligand field in square planer complexes – Jahn-Teller effect (distortion from symmetrical arrangement) – crystal field stabilization energies.	2	4
• Preparation of coordination compounds (complexes); direct reactions – oxidation and reduction reactions – thermal decomposition reactions.	2	4
• Electronic spectrum of complexes - infrared spectra of the metal complexes.	1	2
• Metal complexes of significant biological activities.	2	4
Laboratory Part:		
• Introduction about coordination chemistry and safety rules in labs.	**1**	**3**
• Preparation of $[Cu(en)_2](NO_3)_2$	**2**	**6**
• Preparation of $[Co(NH_3)_5Cl]Cl_2$	**2**	**6**
• Preparation of $K_3[Cr(C_2O_4)_3]$	**2**	**6**
• Preparation of $[Ni(en)_3]Cl_2.2H_2O$	**2**	**6**
• Preparation of [Fe(acac)3]	**1**	**3**
• Melting points of the metal complexes.	**1**	**3**
• Solubility of the metal complexes.	**1**	**3**
• Conductivity of the metal complexes.	**1**	**3**
• Final practical exam.	**1**	**3**

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	**28**	**-**	**42**			**70**
Credit	**2**	**-**	**1**			**3**

3. Additional private study/learning hours expected for students per week.

- The student spends two hours a week to prepare reports, discuss and resolve questions.

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	**Course Teaching Strategies**	**Course Assessment Methods**
1.0	**Knowledge**		
1.1	Describe the nature, types and importance of coordination compounds.	• Lectures • Scientific discussion • Use the library to work duties and a small research on the nature and types of metallic complexes. • Use of the Internet to carry out some reports on course subjects.	• Written mid-term and final exams. • Long and short essays.
1.2	Explain the preparation methods of coordination compounds.		
1.3	Name the complexes according to the IUPAC system.		
1.4	Determine the mode of bonding in metal complexes using bonding theories.		
1.5	Mention the important applications of metal complexes.		

2.0	**Cognitive Skills**		
2.1	Confirm the molecular formula of metal complexes.	• Lectures • Scientific discussion • Library visits • Web-based study	• Periodic tests and assignments and practical experiments. • Measuring the response to the assignments.
2.2	Estimate the type of metal complex.		
2.3	Apply the analytical calculations to know the complex.		
2.4	Design scientific methods and think to solve problems concerning the course.		
3.0	**Interpersonal Skills & Responsibility**		
• Ability to work in a team to perform a specific experimental tasks. • Ability to work independently to handle chemicals • Ability to communicate results of work to classmate and participation in class or laboratory discussions		• Class discussions • Research activities	• Performance on in-practical exams. • Work on research activity. • Overall student performance in Lab. discussions • Cross questions after finishing laboratory work
4.0	**Communication, Information Technology, Numerical**		
4.1	Evaluate the different methods of preparation of inorganic compounds	• The use of computers in the training room of	• Web-based student performance systems • Individual and group
4.2	Use computers and the international information network (the Internet) to		

	perform calculations and to identify recent research relevant to decision sources.	the department. • Visiting research centers. • Using the internet for collecting data.	presentations. • Evaluation of the duties associated with the proper use of numerical and communication skills.
	Perform mathematical calculations and data analysis.		
5.0	**Psychomotor**		
5.1	Laboratory practice . including 1.Locate Materials Safety Data Sheets, chemicals carcinogens list, and hazardous chemicals list. 2. Handle chemicals safely with a proper PPE 3.Dilute solutions, repeat analysis and calculate true result for all procedures performed as required. 4.Pipette accurately at all times 5. Titrate and weight efficiently in right way 6.Dispose the hazardous solution in right way	Practical session should include both demonstration and experiments .	1.Repetition of the experiments , to reproduce the results 2.Written report of chart and procedures. 3.The students should be able to correlate their results with experimental conditions
5.2			

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	Midterm Exam.	8	20 %
3	Practical Exam.	14	30 %
4	Final Exam.(2 hours exam)	16	40 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)
   - Availability of Staff members to provide counseling and advice.
   - Office hours: During the working hours weekly.

- Academic Advising for students.

E. Learning Resources

1. List Required Textbooks
   - P. L. Soni, Vandna Soni, Coordination Chemistry: Metal Complexes, CRC Press, 2013.

2. List Essential References Materials (Journals, Reports, etc.)
   - Geoffrey A. Lawrance, Introduction to Coordination Chemistry, John Wiley & Sons, 2009.
   - William L. Jolly, Modern Inorganic Chemistry; (2nd edition) McGraw-Hill, New York, 1991.

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)
   - Kazuo Nakamoto, Infrared and Raman Spectra of Inorganic and Coordination Compounds, John Wiley &Sons, 2009.
   - James E. Huheey , Inorganic chemistry , Prentic Hall ; (4th edition) , 1997

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)
   - http://www.chemweb.com
   - http://www.sciencedirect.com
   - http://www.rsc.org

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software. : **- Not required.**

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)
   - Equipped lecture halls and laboratories equipped specializing in inorganic chemistry.

2. Computing resources (AV, data show, Smart Board, software, etc.)

- Room equipped with computers, data show and TV.

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- **No other requirements.**

G. Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Complete the questionnaire evaluation of the course in particular.

2. Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- Preparation of a course report and study of the results of the students to give us indication about the planned outputs and the extent to which student's benefits.

3. Processes for Improvement of Teaching

- Training programs and workshops for Staff member.
- Review of strategies proposed.
- Providing new tools for learning.
- The application of e-learning.
- Eexchange of experiences internal and external.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- Check marking of a sample of exam papers, or student work.
- Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.

5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- Periodic review of the contents of the syllabus and modify the negatives.
- Consult other staff of the course.
- Hosting a visiting staff to evaluate of the course.

- Workshops for teachers of the course.

Faculty or Teaching Staff: Prof. Abdalla Mohamed Khedr

Signature: **Date Report Completed: 2018**

Received by: Dr. Ismail Althagafi Department Head

Signature: _________________________________ Date: ________________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Inorganic Reaction Mechanism and Spectra

4024573-2

Course Specifications
(CS)

1436/1437H
2015/2016

Course Specifications

Institution: Umm Al-Qura University	Date of Report: 1436/1437
College/Department : Faculty of Applied Science / Department of Chemistry	

A. Course Identification and General Information

1. Course title and code: Inorganic Reaction Mechanism and Spectra/**4024573-2**
2. Credit hours: 2 (theoretical)
3. Program(s) in which the course is offered: **Chemistry**

(If general elective available in many programs indicate this rather than list programs)

4. Name of faculty member responsible for the course: **Prof. Nashwa Mahmoud El-Metwaly**
5. Level/year at which this course is offered: seventh/fourth
6. Pre-requisites for this course (if any): **Coordination Chemistry**
7. Co-requisites for this course (if any): Nothing
8. Location if not on main campus: **both on El-Abedyah and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ☒ What percentage? 100%

b. Blended (traditional and online) What percentage? %

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage? ☐

Comments:

B. Objectives

1. What is the main purpose for this course?

By the end of the study of this course students, will be aware fully with:

a. The basic concepts of mechanism of inorganic reactions, including the substitution reactions of the ligands and some oxidation & reduction reactions.

b. The basic concepts of the vibrational and electronic spectra of the transition metal complexes, which includes the charge transfer and ligand-field spectra.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

- Using effective teaching in smart classes.
- E-learning system is being introduced and the students can download course material which can be helpful for him.
- Encourage students to make reports in the course subjects especially the spectra of transition metal complexes.

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
• Introduction on the basic concepts of inorganic reaction mechanism.	1	2
• The rate Laws for several inorganic chemistry reactions.	1	2
• Labile and inert complexes	1	2
• Reaction mechanisms of ligand substitution.	1	2
• Substitution reactions in square planar complexes, trans effect and the theories for it's explanation.	1	2
• Reactions include the substitution of coordinating water.	1	2

• Methods studying complexes reactions - octahedral & square- planar	1	2
• Substitution reactions in octahedral complexes - dissociation and association mechanisms - equation reactions.	1	2
• Aqueous ionic complexes, step wise complex formation, factors affecting the stability of complexes, acids and bases.	2	4
• Mechanism for oxidation-reduction reaction, inner sphere and outer sphere reactions.	2	4
• Introduction on the electronic spectra of transition metal complexes and Russell Saunders coupling effects.	1	2
• Energy level diagrams for different selective complexes.	1	2

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	4	0	0	0	32
Credit	2	0	0	0	0	2

3. Additional private study/learning hours expected for students per week.

- 2 additional hours.

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

- Brief summary of the knowledge or skill to develop;

- A description of the teaching strategies to be used in the course to develop that knowledge or skill;

-The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Know several concepts and principles related to inorganic reaction mechanism such as complex geometries.	- Lectures using new techniques. - Meeting individual students and groups to solve their problems related to the course. - Assignments on E-learning.	- First Midterm Exam : 20 % - Second Midterm Exam: 20 % - Activities and assignments on e-learning site: 10 % - Final Exam: 50%
1.2	Recall the history and aims of studying inorganic reaction mechanism.		
1.3	Understand the chemical behavior of chemical compounds during chemical reactions.		
1.4	Know the scientific data and solving problems related to qualitative and quantitative information.		
2.0	**Cognitive Skills**		
2.1	Use the Internet for more information related to the course.	-Making connections between different concepts across the domains. - Using charts and concept maps. - Assigning research questions that can be answered through collecting and analyzing data. - Summarizing the findings of the online research	-Discussing and evaluating the topics that students learn from their textbooks and other sources. - Solving general chemistry problems related to qualitative and quantitative information at the end of each topic. - Individual assignments or oral exam for
2.2	Develop English language skills and symbolic thinking skills.		
2.3	Improve reasoning, perception, and intuition		
2.4	Develop attention, memory, self-regulation, and motor executive functions.		
2.5	Interpret, analyze, summarize, and evaluating the scientific materials.		
2.6	Demonstrate good understanding and retention of basic and advanced chemical principles.		

		- Class discussions. - Using the Internet to create learning activities.	developing/solving a task - Midterm Exams and Final examination at the end of semester.
3.0	**Interpersonal Skills & Responsibility**		
Not Applicable			
4.0	**Communication, Information Technology, Numerical**		
4.1	Communicating personal ideas and thoughts	- using computer science in finishing reports and other related subjects - Group working. - Mini seminars prepared by the students to present their team projects or reports. - Visiting the University library and different web-sites to obtain some related subjects	-Follow up the project progress - Evaluation of the duties associated with the appropriate use of communication skills - Assessments of student's assignments - evaluate solving the equations and problems related to subjects
4.2	Responding to class discussions		
4.3	Developing teamwork skills		
4.4	Collaboration to finish team assignments		
4.5	What relation of Data, Information, and Knowledge		
5.0	**Psychomotor:** Not Applicable		

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	First Periodic Exam.	6	20 %
3	Second Periodic Exam.	12	20 %

4	Final Exam.(2 hours exam)	16	50 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- Two office hours per week for each group of students.

E. Learning Resources

- **Robert B. Jordan, Reaction Mechanisms of inorganic and organometallic systems, 3rd , Oxford University press, 2007**
- **Smiljko Asperger, Chemical Kinetics and inorganic reaction mechanisms, 2ed, Kluwer Academic / Plenum Publisher 2003**
- **Kazuo Nakamoto , Infrared and Raman Spectra of Inorganic and Coordination Compounds, John Wiley & Sons , 2009**

2. List Essential References Materials (Journals, Reports, etc.)

"Kinetics and Mechanisms of Reaction of Transition Metal Complexes," Ralph G. Wilkins, 2nd Thoroughly Revised Edition, VCH Publishers, 1992, ISBN 9783527282531 (Online book access at http://onlinelibrary.wiley.com/book/10.1002/3527600825)

2- "Ligand Substitution Processes," C.H. Langford and H.B. Gray, W.A. Benjamin, Inc., 1966 (Online book access at http://caltechbook.library.caltech.edu/100/1/Langford_Lsp.pdf)

3- Lecture Synopsis at http://www.chem.ox.ac.uk/icl/dermot/mechanism1/

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

- **Robert B. Jordan, Reaction Mechanisms of inorganic and organometallic systems, 3rd , Oxford University press, 2007**
- **Smiljko Asperger, Chemical Kinetics and inorganic reaction mechanisms, 2ed, Kluwer**

Academic / Plenum Publisher 2003

- **Kazuo Nakamoto , Infrared and Raman Spectra of Inorganic and Coordination Compounds, John Wiley & Sons , 2009**

4. List Electronic Materials (eg. Web Sites, Social Media, etc.)

1- "Kinetics and Mechanisms of Reaction of Transition Metal Complexes," Ralph G. Wilkins, 2nd Thoroughly Revised Edition, VCH Publishers, 1992, ISBN 9783527282531 (Online book access at http://onlinelibrary.wiley.com/book/10.1002/3527600825)

2- "Ligand Substitution Processes," C.H. Langford and H.B. Gray, W.A. Benjamin, Inc., 1966 (Online book access at
http://caltechbook.library.caltech.edu/100/1/Langford_Lsp.pdf)

3- Lecture Synopsis at http://www.chem.ox.ac.uk/icl/dermot/mechanism1/

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

- Isisdraw and Chemdraw and Chemoffice

-MS-Office Software

http://scholle.oc.uni-kiel.de/herges/modeling/gliederung.html

http://phycomp.technion.ac.il/~ira/types.html

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- A classroom containing at multi seats and equipped with projector and Internet access (scheduled for 2 hours once a week).

2. Computing resources (AV, data show, Smart Board, software, etc.)

- Common computer labs connected directly with internet are available for all students with high speed internet access

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach

list)

- Programs for chemical uses.

- Internet access for students.

G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Discussion groups of students to learn positives and negatives of all aspects of the scheduled Options.
- Questionnaires assessing students and the work of statistics showing the extent of efficiency and take advantage of the scheduled

2. Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- Self assessments for performance from department
- Continuous questioners conducted by University and introduce the results to each member to investigate it and take care with the comments
- Independent review from specialists inside the department

3 Processes for Improvement of Teaching

- Developing the subject topics periodically
- Workshops on teaching methods.
- Review of teaching strategies.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- Check marking of a sample of exam papers, or student work.
- Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.

5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- Perform the necessary changes based on the feedback from the statistical analysis of the student grades.

Periodic revision of the course from concerned parties in the department and college, and improving it according to what is known in distinguished universities worldwide.

- Perform the necessary changes based on the feedback from the workshops, conferences, and seminars recommendations.
- Perform the necessary changes based on the feedback from the experts in the field and faculty members.

Faculty or Teaching Staff: Prof. Nashwa Mahmoud El-Metwaly

Signature: **Date Report Completed: 2018**

Received by: Dr. Ismail Althagafi **Department Head**

Signature: ______________________________ Date: ______________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Organometallic Chemistry

4024575-2
Course Specifications
(CS)

1436/1437 H

2015/2016 AD

Course Specifications

Institution: **Umm Al-qura University** Date of Report: **2015**

College/Department : **Faculty of Applied Science/ department of chemistry**

A. Course Identification and General Information

1. Course title and code: **Organometallic Chemistry/ 4024575-2**
2. Credit hours: **2 (theoretical)**
3. Program(s) in which the course is offered. **Chemistry**
4. Name of faculty member responsible for the course: **Dr. Hoda El-Ghamry**
5. Level/year at which this course is offered: **7th level/4th year**
6. Pre-requisites for this course (if any): Coordination Chemistry
7. Co-requisites for this course (if any):
8. Location if not on main campus: **both on El-Abedyah and El-Zaher**
9. Mode of Instruction (mark all that apply)

   a. Traditional classroom ☒ What percentage? **100%**

   b. Blended (traditional and online) What percentage?

   c. E-learning ☐ What percentage? ☐

   d. Correspondence ☐ What percentage? ☐

   f. Other ☐ What percentage? ☐

Comments:

B Objectives

1. What is the main purpose for this course?

By the end of studying of this course the student should fully understand:

a. The basic concepts of chemistry of organometallic compounds including their classifications and nomenclature.

b. The chemical and physical properties of organometallic compounds as well as their economic importance.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

- Encourage students to carry out reports in the field of organometallic chemistry.
- Using different learning sources of the course, so that the students make use of more than one reference.
- The use of smart teaching halls for lectures.

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
• History and nomenclature of σ-bonded and π-bonded complexes.	1	2
• Eighteen electron rule – oxidation number.	1	2
• Preparation organometallic compounds: direct reactions between metals and alkyl halides.	1	2
• Preparations involve organometallic compounds: reaction with organic halides, reaction with free metals and their compounds.	1	2
• Substitution reactions: substitution of hydrogen with metal.	1	2
• Addition reactions: addition of metallic compounds to multiple bonds and electrochemical methods.	1	2

• Structure and bonding in organometallic compounds: σ -bonded organometallic compounds – complexes of alkynes and alkenes- π-bonded organometallic compounds	2	4
• Application of organometallic compounds in organic preparations: organolithium compounds, organomagnesium compounds, organocopper compounds, organoaluminium compounds, organosilicon compounds, organoiron compounds.	3	6
• Organometallic complexes of transition metals – unsaturated hydrocarbons.	1	2
• Catalytic applications of organometallic compounds.	2	4

II-General scheme for identification of organic aliphatic unknown

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	-	-	-		28
Credit	2	-	-	-		2

3. Additional private study/learning hours expected for students per week.

- Each student spends 2 hrs each weak in preparing reports and their discussions.

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy:

	NQF Learning Domains And Course Learning Outcomes	**Course Teaching Strategies**	**Course Assessment Methods**
1.0	**Knowledge**		
1.1	Recognize the nomenclature of σ-bonded and π-bonded complexes.	• Lectures • Scientific discussion	• Periodic and final exams.
1.2	Identify the eighteen electron rule and oxidation		

	numbers.	• Library visits • Web-based study	• Web-based student performance systems. • Reports.
1.3	List the methods of synthesis of organometallic compounds.		
1.4	Describe structure and bonding in organometallic compounds compounds.		
1.5	Memorize the application of organometallic compounds in organic preparations: organolithium compounds, organomagnesium compounds, organocopper compounds, organoaluminium compounds, organosilicon compounds, organoiron		
1.6	Recall some catalytic application of organometallic compounds.		
2.0	**Cognitive Skills**		
2.1	Explain the nomenclature of σ-bonded and π-bonded organometallic compounds.	• Lectures • Scientific discussion • Library visits • Web-based study	• Periodic and final exams. • Web-based student performance systems. • Reports.
2.2	Apply the eighteen electron rule to the organometallic compounds.		
2.3	Summarize the preparation methods of the organometallic compounds.		
2.4	Explain the structure and bonding in organometallic compounds.		
2.5	Interpret examples of organometallic compounds such as organolithium, organomagnesium, organocopper, organoaluminium, organosilicon, organoiron.		
3.0	**Interpersonal Skills & Responsibility**		
NOT APPLICABLE			
4.0	**Communication, Information Technology, Numerical**		
	• Evaluate the different methods of preparation of organometallic compounds • Illustrate reactions of different organometallic compounds. • Use information and communication technology. • Use IT and communication technology in gathering and interpreting information and ideas. • Use the internet as a means of communication and a source of information. • Encourage students to use internet for searching	• Lectures • Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations

	certain electronic journals regarding topics of the course. • Scientific writing. • Use his/her observations to solve problems.		
5.0	**Psychomotor**		
5.1	NOT APPLICABLE		
5.2			

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	First Periodic Exam.	6	20 %
3	Second Periodic Exam.	12	20 %
4	Final Exam.(2 hours exam)	16	50 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- Office hours: During the working hours weekly.
- Academic Advising for students.
- Availability of Staff members to provide counseling and advice.

E. Learning Resources

1. List Required Textbooks
   - Lecture Hand outs available on the coordinator website

2. List Essential References Materials (Journals, Reports, etc.)

- James E. Huheey,"***Inorganic Chemistry: Principles of Structure and Reactivity",*** 4th Edition, 2006, Pearson Education India.
- B.D. Gupta, Anil J. Elias "***Basic Organometallic Chemistry: Concepts, Syntheses and Applications"*** 2013, Universities Press.

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

- R.H. Crabtree "**The Organometallic Chemistry of the Transition Metals**" 6th ed. 2014, Wiley puplisher.
- Leah Renold***, Applied Organometallic Chemistry and Catalysis,*** 2005, Oxford University Press.

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com**
- **http://www.sciencedirect.com**
- **http://www.rsc.org**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software: Non

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)
   - Classrooms capacity (30) students.

2. Computing resources (AV, data show, Smart Board, software, etc.)

- Room equipped with computers and projectors**.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- No other requirements.

G. Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Questionnaire evaluation of the course in particular.

2 . Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- Preparation of a course report and study of the results of the students to give us indication about the planned outputs and the extent to which student's benefits.

3. Processes for Improvement of Teaching

- Application of e-learning.
- Exchange of experiences internal and external.
- Review of strategies proposed.
- Providing new tools for learning.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- Check marking of a sample of exam papers, or student work.
- Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- Periodic Review of the contents of the syllabus and modify the negatives.
- Consult other staff of the course.
- Hosting a visiting staff to evaluate of the course.
- Workshops for teachers of the course.

Faculty or Teaching Staff: **Dr Hoda El-Ghamry**

Signature: **Date Report Completed: 2018**

Received by: Dr. Ismail Althagafi **Department Head**

Signature: ________________________________ **Date:** _______________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Solid State Chemistry

4024582-2

Course Specifications
(CS)

1436/1437H
2015/2016

Course Specifications

Institution: Umm Al-Qura University	Date of Report: 2015
College/Department : Faculty of Applied Science / Department of Chemistry	

A. Course Identification and General Information

1. Course title and code: Solid State Chemistry / **4024582-2**
2. Credit hours: **2 theoretical**
3. Program(s) in which the course is offered. **Chemistry**

(If general elective available in many programs indicate this rather than list programs)

4. Name of faculty member responsible for the course: **Prof. Nashwa Mahmoud El-Metwaly**
5. Level/year at which this course is offered: seventh/fourth
6. Pre-requisites for this course (if any): Coordination Chemistry
7. Co-requisites for this course (if any): Nothing
8. Location if not on main campus: **both on El-Abedyah and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ■ What percentage? 100%

b. Blended (traditional and online) What percentage? ☐

c. e-learning What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage? ☐

Comments:

B. Objectives

1. What is the main purpose for this course? The main purpose for this course is to study: a. The bases of solid state chemistry. b. Crystallography and their kinds. c. The effect of X-ray on different crystals d. The crystallographic shapes and semiconductors.
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) • Diversify the sources of the course topics for benefit from more than one source. • Compared the topics of what is served in other local, regional and global sections.

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact Hours
Introduction to solid state chemistry	1	2
Study the crystal structures properties, crystal lattice, type of crystals (covalent - ionic)- cubic centered face- cubic centered body.	1	2
Learn Bravais lattices	1	2
Study the symmetry operators , elements and axis of rotation, symmetry and point group of molecules and point group of unit cells-point groups and space groups	2	4
Calculate the volume of the unit cell , atomic radius , number of molecules , close and square packing and the density	1	2

X- ray diffractions and Bragg's law	1	2
Crystal structure of solids: Solid crystallography- X-Ray crystallography (interference phenomenon and diffraction method)	2	4
X-ray diffraction in the crystal structure - X-ray absorption- X-Ray spectrum - experimental crystal study (Lewis method - Rotatable crystal-powder diffraction)	1	2
How to calculate Miller indices of directions and planes-calculate inter-planar d -spacing (dhkl)	1	2
The crystal binding in solid Material, lattice energy and ionic charge.	1	2
How to detect the crystal defects and types of defects.	1	2
Effect of impurities on the properties of semiconductors (n-type and p-type semiconductor).	1	2

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	4	0	0	0	32
Credit	2	0	0	0	0	2

3. Additional private study/learning hours expected for students per week.

- 2 hours per week for homework’s on e-learning website.

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy:

- A brief summary of the knowledge or skill the course is intended to develop;
- A description of the teaching strategies to be used in the course to develop that knowledge or skill;

- The methods of assessment to be used in the course to evaluate learning outcomes in the domain concerned.

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Understand the concepts of basic principles structures of solid state.	-Lectures. - Dialogue and discussion -Video shows - Assignment on e-learning cite of the University	Two midterm and final exams that consist of the following types of knowledge questions (40% of final assessment): 10 % assessment for Quizzes, open discussion as groups and homework at e-learning 50% the final exam
1.2	Recall the crystal systems and their properties and how different between polymorphism and isomorphism.		
1.3	Know how to calculate Miller Indices of directions and plans		
1.4	Recall the crystal defects, types of defects (point, line, surface) and how to calculate the concentrations of the defects according to types of defects.		
1.5	Define X-ray diffraction in the crystal structure X-ray absorption- X-Ray spectrum - experimental crystal study (Lewis method - Rotatable crystal- powder diffraction)		
2.0	**Cognitive Skills**		
2.1	Calculate the concentrations of the defects according to types of defects.	- lecture using smart classes - Dialogue and discussion. - Posting many examples and questions on the web page as homework .	-Two midterm and final exams that consist of the following types of cognitive skills
2.2	Calculate Miller Indices at different directions and plans		

2.3	Define the crystal system and their properties such as no of molecules , coordination numbers for the different cubic systems	- Offering the available references in the library and websites specialized in this field for the students. - Demonstrating the different shapes for cubic systems , conduction in metals using videos - Offering the different Models for Bravais lattices and lattice types	questions (40% of mid assessment): - (5 % of final assessment) : Homework assignments . - (5 % of final assessment) : Quizzes Final exam (50%)
3.0	**Interpersonal Skills & Responsibility**		
3.1	Educating student about ethics of dealing with his colleagues and with the instructors and supervisor	-Distribution students to different groups to acquire skills of dealing with everyone. - Discussion in groups - Written reports about one of topic related of the course	-Assessment of assignments includes portion of grade for effectiveness of investigation processes. - Personal performance in classroom.
3.2	Teaching students the responsibility toward themselves and toward others.		
3.3	Working in group to make the students aware of responsibility		
3.4	Instilling the self-learning character in the student		
3.5	Decision-making (independence)		
4.0	**Communication, Information Technology, Numerical**		
4.1	The ability to communicate with his colleagues	-Applying the effective tools for Student assignments.	-Assignments of home works in the e-

4.2	Enhancing the knowledge in information technology that will enable them to gather, interpret, and communicate information and ideas	- Teaching by using the e-learning tools. - Given 5 min at the end of each lecture to selected one of students to re-mentioned again the main topics introduced in lecture	learning website as well as solve problems in the different exams
4.3	Providing sufficient information about how to thinking to solve problems that will enable them to apply in interpreting and proposing solutions		
4.4	Communicate via the available electronic tools		
4.5	The use of search engines across the Web		
5.0	**Psychomotor**		
	No applicable		

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	First Periodic Exam.	6	20 %
3	Second Periodic Exam.	12	20 %
4	Final Exam.(2 hours exam)	16	50 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

-Office Hours: 5 hours

Total 5 hrs. of office hours for individual student consultations and academic advice per week in e-learning as mentioned before**.**

E. Learning Resources

1. List Required Textbooks

- المبادئ الأساسية في فيزيفا الجوامد" كتاب شارل كتيل ترجمة يوسف لبيب

Lesley E. Smart, Elaine A. Moore, Solid State Chemistry: An Introduction, 4th , CRC press (Taylor & Frances) 2012

- Lesley E.Smart , Elaine A.Moore , Solid State Chemistry ; An Introduction, 3rd, Taylor & Francis Group, 2005 LLC

2. List Essential References Materials (Journals, Reports, etc.)

Lesley E. Smart, Elaine A. Moore, Solid State Chemistry: An Introduction, 4th , CRC press (Taylor & Frances) 2012

- Lesley E.Smart , Elaine A.Moore , Solid State Chemistry ; An Introduction, 3rd, Taylor & Francis Group, 2005 LLC

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

Lesley E. Smart, Elaine A. Moore, Solid State Chemistry: An Introduction, 4th , CRC press (Taylor & Frances) 2012

- Lesley E.Smart , Elaine A.Moore , Solid State Chemistry ; An Introduction, 3rd, Taylor & Francis Group, 2005 LLC

4. List Electronic Materials (eg. Web Sites, Social Media, etc.)

http://www.mx.iucr.org/iucr-top/comm/cteach/pamphlets/13/node5.html

http://img.chem.ucl.ac.uk/sgp/mainmenu.htm

www.shef.ac.uk/.../solid-state-chemistry-applications-msc

www.simplybooks.in/solid-state-chemistry-its-anthony-r-book..

www.infibeam.com/.../solid-state-chemistry-its-applications/9...

http://www.seas.upenn.edu/~chem101/sschem/solidstatechem.html

http://www.webqc.org/symmetry.php

http://en.wikipedia.org/wiki/Molecular_geometry

http://en.wikipedia.org/wiki/Molecular_graphics

http://butane.chem.uiuc.edu/cyerkes/Chem102AEFa07/Lecture_Notes_102/newL102.htm-ecture%2014

/Science/Chemistry/Lewis_Structures_VSEPRhttp://www.wyzant.com/Help

http://www2.chemistry.msu.edu/faculty/reusch/VirtTxtJml/intro3.htm

drills.com/VSEPR.php-.chemistryhttp://www

http://cat.middlebury.edu/~chem/chemistry/class/general/ch103/chapter9/Test.html kiel.de/herges/modeling/gliederung.html-http://scholle.oc.uni faculty.ucsd.edu/trogler/GroupTheory224/Grouptheory.html-http://chem http://www.seas.upenn.edu/~chem101/sschem/solidstatechem.html http://phycomp.technion.ac.il/~ira/types.html http://en.wikipedia.org/wiki/Solid-state_chemistry www.shef.ac.uk/.../**solid-state-chemistry-applications**-msc www.simplybooks.in/**solid-state-chemistry-its**-anthony-r-book.. www.infibeam.com/.../**solid-state-chemistry-its-applications**/9... http://books.google.com.sa/books?id=-EKCm5UQaqEC&hl=ar&redir_esc=y
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software. - Isisdraw and Chemdraw and Chemoffice -MS-Office Software http://scholle.oc.uni-kiel.de/herges/modeling/gliederung.html http://chem-faculty.ucsd.edu/trogler/GroupTheory224/Grouptheory.html http://phycomp.technion.ac.il/~ira/types.html

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) - A classroom containing at least 45 seats and equipped with projector and Internet access (scheduled for 2 hours once a week).

2. Computing resources (AV, data show, Smart Board, software, etc.) - Common computer lab containing at least 25 computer sets. - High speed internet access.
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) - Isisdraw and Chemdraw and Chemoffice

G. Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Confidential completion of standard course evaluation questionnaire.
- Focused group discussion with small groups of students.
- Review with the department chairman.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- Observations and assistance from colleagues.

3 Processes for Improvement of Teaching

- Workshops on teaching methods.
- Review of recommended teaching strategies.
- Periodical department revisions by using specialists.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- Check marking by an independent member teaching staff of a sample of student work.

5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- Periodic revision of the course from concerned parties in the department and college, and improving it according to what is known in distinguished universities worldwide.
- Perform the necessary changes based on the feedback from the statistical analysis of the student grades.
- Perform the necessary changes based on the feedback from the workshops, conferences, and seminars recommendations.
- Perform the necessary changes based on the feedback from the experts in the field and faculty members.

Faculty or Teaching Staff: Prof. Nashwa Mahmoud El-Metwaly

Signature: **Date Report Completed: 2018**

Received by: Dr. Ismail Althagafi Department Head

Signature: ______________________________ **Date:**

INDUSTRIAL CHEMISTRY STUDY PLAN

FIRST YEAR

LEVEL 1

Course No.	Course Name	Credits	
		Theo.	Theo.
4041011-4	Calculus	4	
40210101-4	General Chemistry 1	3	1
705101-4	English	4	
605101-2	Quran1	2	
601101-2	Islamic culture 1	2	

LEVEL 2

Course No.	Course Name	Credits	
		Theo.	Theo.
4011012-4	General Biology	3	1
4031012-4	General Physics	3	1
705102-4	English for Applied Science	4	-
501101-2	Arabic Language	2	-
102101-2	Prophetic Biography	2	-

SECOND YEAR			
LEVEL 3			
Course No	Course Name	Credits	
		Theo.	Theo.
40220340-2	General Chemistry 2	2	-
40220330-3	Chemistry of Aliphatic Compounds	2	1
40220320-3	Gravimetric and Volumetric Analytical Chemistry	2	1
40220321-2	Qualitative Analytical Chemistry	1	1
40220350-3	Thermodynamics	2	1
605201-2	Quran2	2	-
601201-2	Islamic culture 2	2	-

LEVEL 4			
Course No	Course Name	Credits	
		Theo.	Theo.
4023551-3	Physical Organic Chemistry	3	-
4023552-2	Chemistry of Transition Elements	2	-
4023553-2	Quantum Chemistry	2	-
4023554-3	Surface Chemistry	2	1
4023555-3	Spectrophotometric and Electrochemical Methods of Analysis	2	1
4023556-3	Heterocyclic Chemistry	2	1
605301-2	Quran3	2	-

THIRD YEAR

LEVEL 5

Course No	Course Name	Credits	
		Theo.	Theo.
4023551-3	Physical Organic Chemistry	**3**	**-**
4023752-3	Petroleum Chemistry	2	1
4023555-3	Spectrophotometric and Electrochemical Methods of Analysis	**2**	**1**
4023552-2	Chemistry of Transition Elements	**2**	**-**
4023554-3	Surface Chemistry	**2**	**1**
601401-2	Islamic Culture 4	**2**	**-**
605301-2	Quran3	2	-

LEVEL 6

Course No	Course Name	Credits	
		Theo.	Theo.
4023564-3	Coordination Chemistry	**2**	**1**
4023556-3	Heterocyclic Chemistry	**2**	**1**
4023561-3	Organic Spectroscopy	**2**	**1**
4023562-3	Separation Methods and Thermal Analysis	**2**	**1**
402376**5**-2	Quantum Chemistry and Molecular Spectroscopy	**2**	**-**
402396**6**-3	Summer Training	**3**	**-**

FOURTH YEAR

LEVEL 7

Course No	Course Name	Credits	
		Theo.	Theo.
3-4024771	Dyes and Fibers	**2**	**1**
1-4024772	Chemistry of Cosmetics	1	**-**
1-4024773	Water Treatment	1	**-**
2-4024774	Inorganic Chemistry Industries	**2**	**-**
2-4024775	Industrial analysis and quality measurements	**1**	**1**
2-4024776	Petrochemicals Industries	**2**	**-**
3-4024777	Industrial Application of Catalysis	**2**	**1**
2-4024778	Corrosion and Electroplating	**2**	**-**
2-605401	Quran4	**2**	**-**

LEVEL 8

Course No	Course Name	Credits	
		Theo.	Theo.
4024781-2	Industrial Food Chemistry	**2**	**-**
4024782-2	Chemistry of detergents and pesticides	**2**	**-**
4024574-2	Environmental Chemistry	**2**	**-**
4024784-2	Chemistry of Cement and Construction Materials	**2**	**-**
4024785-2	Medicinal Chemistry	**2**	**-**
4024584-2	Nanochemistry	**2**	**-**
4024987-3	Graduation Project	**3**	**-**
4024581-3	Polymer Chemistry	**2**	**1**

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7

Industrial Chemistry Courses

A-Analytical Chemistry Courses

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specifications
(CS)

Qualitative Analytical Chemistry
4022134-2

Course Specifications

Institution: Umm Al-Qura University Date of Report

College/Department : Applied Science /Chemistry Department

A. Course Identification and General Information

1. Course title and code: Qualitative Analytical Chemistry/ **4022134-2**
2. Credit hours : 2 hrs (1 theoretical + 1 practical)
3. Program(s) in which the course is offered. **Chemistry**
(If general elective available in many programs indicate this rather than list programs)
4. Name of faculty member responsible for the course: **Dr. Marwa El Ghalban**
5. Level/year at which this course is offered : 3rd level
6. Pre-requisites for this course (if any) : General Chemistry (1)
7. Co-requisites for this course (if any)
8. Location if not on main campus : both on El-Abdyah, and El-Zaher
9. Mode of Instruction (mark all that apply)

a. Traditional classroom	☒	What percentage?	100
b. Blended (traditional and online)	☐	What percentage?	
c. e-learning	☐	What percentage?	
d. Correspondence	☐	What percentage?	
f. Other	☐	What percentage?	

B Objectives

1. What is the main purpose for this course? By the end of this course student will be able to know the fundamentals of analytical chemistry and has the ability to identify different methods used for qualitative analysis.
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) encourage students to make reports in the recent trends in the field of analytical chemistry, either from the library or by using the Internet

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Inorganic qualitative analysis: its classifications and its applications	1	1
The solutions (Types of solutions – the solubility and factors effecting solubility – Solubility of aqueous ,ionic and non ionic compounds –methods for expression concentrations	1	1
The chemical equilibrium – The rate of chemical reactions.	1	1
Acid- Base equilibrium, Dissociation of water, pH and Neutralization Indicators	1	1
Hydrolysis of salts, acids and weak base	1	1
Buffer solution in qualitative analysis	1	1
Colloidal solutions (colloidal particles and electric charge – pepitization – colloidal particles precipitation – conditions of ideal precipitation)	2	2
The precipitates and law of solubility product	1	1
Mid term exam	1	1
The factors effecting on the solubility of precipitates and separations of ionic groups.	1	1
equilibrium of complex formation (Coordination complexes, its structure and types of bonds in ionic complexes)	1	1

Types of ionic complexes –application of equilibrium law on complexes reactions - application of complex formationin qualitative analysis	1	1
Oxidation reduction equilibrium	1	1
General revision and preparatory exam	1	1
Laboratory ▪ Identify acidic radicals of first group using dilHCl ▪ Identify acidic radicals of second group and Conc. H_2SO_4 ▪ Identify acidic radicals of third group using $BaCl_2$ ▪ Revision on acidic radicals ▪ Identify basic radicals of first group(Hg_2^{2+}, Pb^{2+}, Ag^+) ▪ Identify basic radicals of second group (Hg^{2+}, Cu^{2+}, Cd^{2+}, Bi^{3+}) ▪ Identify basic radicals of third group (Al^{3+}, Cr^{3+}, Fe^{3+}) ▪ Identify basic radicals of fourth group (Mn^{2+}, Zn^{2+}, Co^{2+}, Ni^{2+}) ▪ Identify basic radicals of fifth group (Sr^{2+}, Ca^{2+}, Ba^{2+}) ▪ Identify basic radicals of sixth group (NH_4^+, Mg^{2+}, Na^+, K^+) ▪ Revision on basic radicals	14	

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	14	-	42			56
Credit	1	-	1	-		2

3. Additional private study/learning hours expected for students per week. 2hr

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		

1.1	Recognize classification and application of qualitative analysis	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • long and short essays posters lab manuals
1.2	Discover the factors affecting on the solubility, precipitation		
1.3	Explain methods to express concentration and Identify chemical , kinetic equilibrium and acid base equilibrium		
1.4	understand ionic and nonionic compounds, electrolytic and non electrolytic		
1.5	Know Colloidal solutions and conditions of ideal precipitation		
1.6	Mention the importance of complex formation as application in qualitative analysis		
2.0	**Cognitive Skills**		
2.1	Develop the reverse think skills and student gains the practical skills to choose the suitable methods for aqueous solutions solubility	1. group discussions 2. case study. 3. home work assignment containing problem thinking activities	1.Midterm exam 2.quizzes 3.Group discussion 4.Final exam
2.2	Gains the skills for acid base equilibrium and Redox equilibrium		
2.3	Select the suitable method for expressing concentration		
2.4	Design different methods to determine the rate of chemical reactions		
2.5	predict conditions of ideal precipitation		
2.6	plan to make research program in qualitative analysis according to systematic steps		
2.7	Compare between the different equations in Redox process		
3.0	**Interpersonal Skills & Responsibility**		
3.1	• Ability to work in a team to perform a specific experimental tasks. • Ability to work independently to handle chemicals • Ability to communicate results of work to classmate and participation in class or ab oratory discussions	• Class discussions • Research activities	• Performance on in-practical exams. • Work on research activity. • Overall student performance in Lab. Discussions • Cross questions after finishing laboratory work
4.0	**Communication, Information Technology, Numerical**		
4.1	Communicate effectively in oral and written forms	1.Write a Report 2.Use digital libraries and/or E-Learning Systems for the communication with lecturer through the course work	1.Evaluating the activities of the students through the semester for their activities on the E-learning system, as well as, their communication with each other in different tasks. 2.Evaluation of the report presented
4.2	Use information and communication technologies Use basic mathematical and statistical techniques		

5.0	**Psychomotor**		
	Laboratory practice . including 1.Locate Materials Safety Data Sheets, chemicals carcinogens list, and hazardous chemicals list. 2. Handle chemicals safely with a proper PPE 3.Dilute solutions, repeat analysis and calculate true result for all procedures performed as required. 4.Pipette accurately at all times 5. weight efficiently in right way 6.Dispose the hazardous solution in right way	Practical session should include both demonstration and experiments .	1.Repetition of the experiments , to reproduce the results 2.Written report of chart and procedures. 3.The students should be able to correlate their results with experimental conditions

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	Midterm Exam.	8	20 %
3	Practical Exam.	14	30 %
4	Final Exam.	16	40 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- We have faculty members to provide counseling and academic advice.
- 2 hours per week as office hours are available for discussion with the students.

E. Learning Resources

1. List Required Textbooks

- Douglas A. Skoog, Donald M. West, F. James Holler, Stanley R. Crouch. Fundamentals of analytical chemistry , 9 edition , Brooks Cole (2014)
- Gary D. Christian, Purnendu K. Dasgupta and Kevin A. Schug, Analytical Chemistry, 7th edition, WILEY (2014).

2. List Essential References Materials (Journals, Reports, etc.)

- Lecture Hand outs available on the coordinator website

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.) • http://en.wikipedia.org/wiki/Petroleum1- http://www.chemhelper.com/ • http://www.chemweb.com/ • http://www.science.uwaterloo.ca/~cchieh/cact/ http://www.sciencedirect.com/
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software. - Microsoft Power Point and Microsoft Word - Qualitative analysis video - Teaching CD for qualitative analysis

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) • Classrooms capacity (30) students. Providing hall of teaching aids including computers and projector.

2. Computing resources (AV, data show, Smart Board, software, etc.) Room equipped with computer and projector and TV
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Student discussion with the instructor allow for continuous feed back through the course progress.
- Student Evaluation Questionnaires.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- Discussions within the group of faculty teaching the course.
- Peer consultation on teaching strategies and its effectiveness.

3 Processes for Improvement of Teaching

- Workshops given by experts on new teaching and learning methodologies will be attended.

Improving of the teaching strategies by monitoring the evaluation of the students progress through the semester

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

Not effective yet.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- The course will be evaluated periodically after each semester based on the results of the students and the report presented by the teaching stuff that will be discussed with the course coordinator so as to improve the course.

Faculty or Teaching Staff: **Dr. Marwa El Ghalban**

Signature: **Date Report Completed: 2016**

Received by: Dr. Ismail Althagafi **Department Head**

Signature: ________________________________ **Date:** _______________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Volumetric and Gravimetric Analytical Chemistry

4022133-3

Course Specifications
(CS)

Course Specifications

Institution: **Umm Al-qura University** Date of Report: **2016**

College/Department : **Faculty of Applied Science/ department of chemistry**

A. Course Identification and General Information

1. Course title and code: **Volumetric and Gravimetric Analysis Chemistry/ 4022133-3**
2. Credit hours: **4 hrs** (2 theoretical + 1 practical)**.**
3. Program(s) in which the course is offered. **Chemistry**
4. Name of faculty member responsible for the course: **Dr. Marwa El Ghalban**
5. Level/year at which this course is offered: **3rd level / 2rd year**
6. Pre-requisites for this course (if any): **General chemistry1**
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **both on El-Abdyah, and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ☒ What percentage? **100%**

b**. Blended (traditional and online)** What percentage?

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other What percentage

Comments:

B Objectives

1. What is the main purpose for this course? **1.1.** Know the theoretical principle of volumetric and gravimetric analysis. **1.2.** Familiar with statistical methods and solution concentration parameters in chemical measurements **1.3.** Study the procedures required to gravimetric analysis and factors which effect the precipitation process **1.4.** Classify varies titrations and their applications in water analysis and manufacture **1.5.** Using different indicators and pH control in the different titrations **1.6.** Compare between Mohr, Volhard and Fajans methods in precipitation titrations **1.7.** Know difference between (co-precipitation and post-precipitation), (weight form and precipitate form) and the role of different pricipitants
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) **The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course**

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact Hours
a. Classification and applications of quantitative analysis and solution concentration parameters	1	2
b. The principles of volumetric analysis and statistical methods – neutralization titrations theory- pH measurements.	1	2
c. Buffer solutions, their working theory and their applications- Indicators in neutralization titrations and the applications of neutralization titrations in manufacture, pharmaceutical and biochemistry fields	1	2
d. Precipitation theory, adsorption indicators, applications of precipitation titrations and titrations which include complexes formation	1	2
e. Compleximetry titrations and their applications in water analysis and manufacture and reduction – oxidation (Redox) titrations and their applications.	1	2
f. Principles and requirements of gravimetric analysis	1	2
g. Theoretical principles of precipitation and stages of saturated, supersaturated and solubility product, precipitation formation (nucleation, precipitate growth)	1	2
h. Mid Term exam	1	2

i. Factors affecting the solubility of precipitate, precipitation from homogeneous solution and contamination of precipitates ,types of contaminates (co-precipitation, post precipitation, surface adsorption)	1	2
j. The methods of contaminates removing or minimizing	1	2
k. Organic precipitants, requirements and its application Inorganic precipitants, requirements and its application	2	4
l. Calculations of gravimetric analysis	1	2
m. Revisions and preparatory exam	1	2

Laboratory Part:

- **Standardization of hydrochloric acid using 0.1N sodium carbonate.**
- **Determination of sodium hydroxide and sodium carbonate in mixture using hydrochloric acid**
- **Determination of ammonia in ammonium solution using hydrochloric acid**
- **Standardization of potassium permanganate using oxalic acid**
- **Iodometry and Ioditymetry using sodium thiosulphate**
- **Silver nitrate titrations by Volhard and Mohr methods**
- **Standardization of EDTA using zinc sulphate**
- **Determination of water crystallization in barium chloride salt.**
- **Determination of barium ion as barium sulphate.**
- **Determination of aluminum in alum.**
- **Determination of calcium using ammonium oxalate**
- **Determination of lead as lead chromate**
- **Determination of nickel using dimethylglyoxime**

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	-	42			70
Credit	2	-	1			3

3. Additional private study/learning hours expected for students per week.	2 h

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		

	Recognize principles of volumetric and gravimetric analysis in analytical chemistry	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • long and short essays • posters lab manuals
	Identify the classification of volumetric analysis methods		
	Know the analytical measurements and discover the suitable method and requirements for gravimetric analysis and purification		
	Outline the difference between nucleation, precipitate growth and define the concentration parameters		
	Recognize the meaning of indicators and identify the suitable condition of gravimetric analysis and removal of contamination		
	Describe statistical methods in analytical chemistry.		
	Familiar with neutralization titrations and with organic and inorganic precipitants, requirements and its applications		
	Select the proper method of precipitation titrations methods		
	Name the different reduction-oxidation methods		
	Know the principles of compleximetry titrations		
	Recognize the meaning of metalochromic indicators		
	Outline application important		
2.0	**Cognitive Skills**		
	• Apply the suitable methods to refer to concentration parameters • Compare the different types of volumetric analysis and predict the suitable methods for gravimetric analysis • Explain principles of volumetric methods and its classification. Choose the suitable method to purify the precipitate. • Analyze deferent solutions and pH measurements • Create the different ideas to study the precipitation process, contamination, purification • Appraise the volumetric and gravimetric methods in analytical chemistry • Demonstrate neutralization, redox, precipitation and compleximetry titrations and evaluate the types of precipitants and procedures for gravimetric analysis	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • posters • demonstrations
3.0	**Interpersonal Skills & Responsibility**		

	• Ability to work in a team to perform a specific experimental tasks. • Ability to work independently to handle chemicals • Ability to communicate results of work to classmate and participation in class or ab oratory discussions		• Ability to work in a team to perform a specific experimental tasks. • Ability to work independently to handle chemicals • Ability to communicate results of work to classmate and participation in class or ab oratory discussions
4.0	**Communication, Information Technology, Numerical**		
	• Use information and communication technology. • The ability to use e-mail to communicate with the instructor and other students. • Scientific writing. • Use his/her observations to solve problems. • Able to calculate and discuss the facts and logical propose methods to solve the difficulties. • Ability to work in a team to perform a specific task. • Ability to solve problems.	• Lectures • Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
5.0	**Psychomotor**		
	Laboratory practice . including 1.Locate Materials Safety Data Sheets, chemicals carcinogens list, and hazardous chemicals list. 2. Handle chemicals safely with a proper PPE 3.Dilute solutions, repeat analysis and calculate true result for all procedures performed as required. 4.Pipette accurately at all times 5. Titrate and weight efficiently in right way 6.Dispose the hazardous solution in right way	Practical session should include both demonstration and experiments .	1.Repetition of the experiments , to reproduce the results 2.Written report of chart and procedures. 3.The students should be able to correlate their results with experimental conditions

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	Midterm Exam.	8	20 %
3	Practical Exam.	14	30 %
4	Final Exam.	16	40 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

- Douglas A. Skoog, Donald M. West, James F. Holler and Stanley R. Crouch, ***Analytical Chemistry***, 7th edition, Springer (2014)
- Gary D. Christian, Purnendu K. Dasgupta and Kevin A. Schug, ***Analytical Chemistry***, 7th edition, WILEY (2014)

2. List Essential References Materials (Journals, Reports, etc.)

- Lecture Hand outs available on the coordinator website

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

-

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com**
- **http://www.sciencedirect.com**
- **http://www.rsc.org**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)
   - **Classrooms capacity (30) students.**
   - **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

- **Room equipped with computer and projector and TV.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

Complete the questionnaire evaluation of the course in particular.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- **Observations and the assistance of colleagues.**
- **Independent evaluation for extent to achieve students the standards.**
- **Iindependent advice of the duties and tasks.**

3 Processes for Improvement of Teaching

- **Workshops for teaching methods.**
- **Continuous training of member staff.**
- **Review of strategies proposed.**
- **Providing new tools for learning.**
- **The application of e-learning.**
- **Eexchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for

improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: **Dr. Marwa El Ghalban**

Signature: **Date Report Completed: 2016**

Received by: Dr. Ismail Althagafi **Department Head**

Signature: ________________________________ Date: _______________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Organic analytical chemistry

4022145-3

Institution: **Umm Al-qura University** Date of Report: **2017**

College/Department : **Faculty of Applied Science/ department of chemistry**

A. Course Identification and General Information

1. Course title and code: **Organic Analytical Chemistry/4022145-3**
2. Credit hours: **3 hrs** (2 theoretical + 1 practical)**.**
3. Program(s) in which the course is offered. **Chemistry program**
4. Name of faculty member responsible for the course: **Prof. Amr L Saber**
5. Level/year at which this course is offered: **4th level / 2rd year**
6. Pre-requisites for this course (if any): **Volumetric Analysis Chemistry**
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **both on El-Abdyah, and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom	■	What percentage?	**100%**
b. Blended (traditional and online)		What percentage?	
c. e-learning	☐	What percentage?	☐
d. Correspondence	☐	What percentage?	☐
f. Other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course?
   - **1.1.** Demonstration analytical methods which include the analysis of organic compounds
   - **1.2.** Know the different function groups in organic compounds
   - **1.3.** Determination of the state of unsaturation in organic compounds
   - **1.4.** Stress the different analytical methods to determine organic compounds in real samples
   - **1.5.** Recognize the formation method of oxime

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
1. Determination of elements in organic compounds	2	4
2. Determination of Carboxylic acids	1	2
3. Determination of esters	1	2
4. Determination of amino groups	1	2
5. Determination of hydroxylic groups	1	2
6. Determination of carbonyl groups and their derivatives	2	4
7. Determination of nitro and nitroso groups	1	2
8. Determination of the state of unsaturation in organic compounds	1	2
9. Determination of organic peroxide	1	2
10. Determination of isothiocynate and isocynate	1	2
11. Discussion the formation method of oxime (equilibrium and kinetic study) as a model in organic analytical chemistry	2	4

Laboratory Part:

- **Determination of elements(C, H, O, N,…) in organic compounds.**
- **Determination of formaldehyde concentrations in their solutions**
- **Determination of acetone concentrations in their solutions**
- **Determination of amino and hydroxyl groups**
- **Determination of equivalent weight for carboxylic acid**
- **Determination of the strength of aniline solution**
- **Determination of reduced saccharide**
- **Determination of the equivalence of ester saponification**
- **Determination of amino-acids**

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	-	42			70
Credit	2	-	1			3

3. Additional private study/learning hours expected for students per week.	2 h

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Recognize principles of organic analysis in analytical chemistry.	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • long and short essays • posters lab manuals
1.2	Identify the classification of organic analysis methods		
1.3	Know the procedures of elemental analysis		
1.4	Define the concentration parameters		
1.5	Recognize the meaning of equivalent weight and saponification		
1.6	Describe statistical methods in organic analysis.		
1.7	Select the proper method to determine the strength of aniline solution		
1.8	Demonstrate the state of unsaturation in organic compounds		
1.9	Recognize the formation method of oxime (equilibrium and kinetic study) as a model in organic analytical chemistry		
1.10	Outline application important		
2.0	**Cognitive Skills**		
2.1	Apply the suitable methods for elemental analysis	• Lectures • Scientific discussion	• Exams • web-based student performance systems
2.2	Compare the different types of hetero-organic compounds analysis		

2.3	Explain principles of organic analysis methods and its classification	• Library visits • Web-based study	• portfolios • posters • demonstrations
2.4	Analyze deferent amino-acids compounds		
2.5	Summarize the principles of organic analysis		
3.0	**Interpersonal Skills & Responsibility**		
	• Ability to work in a team to perform a specific experimental tasks. • Ability to work independently to handle chemicals • Ability to communicate results of work to classmate and participation in class or ab oratory discussions	• Class discussions • Research activities	• Performance on in-practical exams. • Work on research activity. • Overall student performance in Lab. discussions • Cross questions after finishing laboratory work
4.0	**Communication, Information Technology, Numerical**		
	• Use information and communication technology. • Scientific writing. • Use his/her observations to solve problems. • Doing research and conduct searches for restoring information. • Able to calculate and discuss the facts and logical propose methods to solve the difficulties.	• Lectures • Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
5.0	**Psychomotor**		
	Laboratory practice . including 1.Locate Materials Safety Data Sheets, chemicals carcinogens list, and hazardous chemicals list. 2. Handle chemicals safely with a proper PPE 3.Dilute solutions, repeat analysis and calculate true result for all procedures performed as required. 4.Pipette accurately at all times 5. Titrate and weight efficiently in right way 6.Dispose the hazardous solution in right way	Practical session should include both demonstration and experiments .	1.Repetition of the experiments , to reproduce the results 2.Written report of chart and procedures. 3.The students should be able to correlate their results with experimental conditions

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment

1	Homework or activities.	--	10 %
2	Midterm Exam.	8	20 %
3	Practical Exam.	14	30 %
4	Final Exam.	16	40 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

- Douglas A. Skoog, Donald M. West, James F. Holler and Stanley R. Crouch, ***Analytical Chemistry***, 7th edition, Springer (2014)

2. List Essential References Materials (Journals, Reports, etc.)

- Lecture Hand outs available on the coordinator website

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

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- Douglas A. Skoog, Donald M. West, James F. Holler and Stanley R. Crouch, *Analytical Chemistry*, 7th edition, Springer (2014)
- Dhruba Charan Dash. *Analytical Chemistry* (2017) PHI Learning Private Limited.

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com**
- **http://www.sciencedirect.com**
- **http://www.rsc.org**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- **Classrooms capacity (30) students.**
- **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

- **Room equipped with computer and projector and TV.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

Complete the questionnaire evaluation of the course in particular.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- **Observations and the assistance of colleagues.**
- **Independent evaluation for extent to achieve students the standards.**
- **Iindependent advice of the duties and tasks.**

3 Processes for Improvement of Teaching

- **Workshops for teaching methods.**
- **Continuous training of member staff.**
- **Review of strategies proposed.**
- **Providing new tools for learning.**
- **The application of e-learning.**
- **Exchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**

- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: **Prof. Amr L Saber**

Signature: **Date Report Completed: 2017**

Received by: Dr. Ismail Althagafi **Department Head**

Signature: ________________________________ Date: _______________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Separation Methods and Thermal Analysis

4023562-3

Course Specifications
(CS)

Course Specifications

Institution: **Umm Al-qura University** Date of Report: **2015**

College/Department : **Faculty of Applied Science/ department of chemistry**

A. Course Identification and General Information

1. Course title and code: **Separation Methods and Thermal Analysis / 4023562-3**
2. Credit hours: **3 hrs** (2 theoretical + 1 practical)
3. Program(s) in which the course is offered. **Chemistry**
4. Name of faculty member responsible for the course: **Dr. Mohammed Kassem**
5. Level/year at which this course is offered: **6th level / 3rd year**
6. Pre-requisites for this course (if any): **Spectrophotometric and Electrochemical techniques 402311-3**
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **both on El-Abedyah, and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ■ What percentage? **100%**

b**. Blended (traditional and online)** ☐ What percentage? ☐
c. e-learning What percentage?

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage?

Comments:

B Objectives

1. What is the main purpose for this course?

By the end of this course the students will

1. **Have all information about mixtures in chemistry**
2. **Familiar with separation process and methods of thermal analysis.**
3. **Able to use many separation tools for separate both organic and in organic mixtures.**

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
1. Separation methods in analytical chemistry, classifications , and solvent extraction technique	2	4
2. Principles of chromatographic methods and its classification	1	2
3. Column chromatography	1	2
4. Liquid-liquid chromatography and Solid-liquid chromatography	1	2
5. Ion exchanger chromatography, ionic chromatography and HPLC	1	2
6. Plane chromatography	1	2
7. Thin layer chromatography (TLC), paper chromatography (PC) and electrophoresis method	1	2
8. Gas chromatography	2	4
9. Gas chromatography in qualitative, quantitative, medical and petroleum analysis	1	2
10. Principles and devices of previous analysis methods	1	2
11. Thermal analysis methods: thermo gravimetric analysis (TGA), (DTG), (DSC) and (DTA)	1	2
12. Calometric analysis and thermal titrations	1	2

Laboratory Part:

- **Solvent extraction of iodine from aqueous layer to organic layer.**
- **Choosing suitable solvent for separation mixture of inks or amino acids using paper chromatography.**
- **Halides separation using thin layer chromatography.**

- **Determination of total concentration of cations in water sample using ion-exchange chromatography.**
- **Using GC to determine retention time, flow rate and internal standard solution then determine pentanol in unknown sample.**
- **Chemical equilibrium measurement using GC for the reaction of methyl acetate with ethyl alcohol.**
- **Determination fatty acid by GC.**
- **Determination of alcohol by GC.**
- **Determination of benzoic acid in beverages by GC.**
- **Determination of drugs in pharmaceuticals using HPLC.**

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	-	42			70
Credit	2	-	1			3

3. Additional private study/learning hours expected for students per week.	2 h

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	**Course Teaching Strategies**	**Course Assessment Methods**
1.0	**Knowledge**		
1.1	Recognize the separation methods in analytical chemistry, classifications , and solvent extraction technique	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • long and short essays • posters lab manuals
1.2	Identify the principles of chromatographic methods and its classification		
1.3	Know the principles of column chromatography		
1.4	Describe liquid-liquid chromatography and Solid-liquid chromatography		
1.5	Familiar with plane chromatography		
1.6	Select the proper method of preparation of an organic molecule		
1.7	Name the different conformations of alkanes and cycloalkanes		
1.8	Determine principles and devices of previous analysis methods		
1.9	Recognize thin layer chromatography (TLC), paper chromatography (PC) and electrophoresis		

	method		
1.10	Memorize the thermal analysis methods		
1.11	Outline calometric analysis		
1.12	Define thermal titrations		
2.0	**Cognitive Skills**		
2.1	Apply separation methods in analytical chemistry	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • posters • demonstrations
2.2	Compare calometric analysis and thermal titrations		
2.3	Explain the principles of chromatographic methods and its classification		
2.4	Analyze liquid-liquid chromatography and Solid-liquid chromatography		
2.5	Summarize the principles and devices of GC and HPLC		
3.0	**Interpersonal Skills & Responsibility**		
• Ability to work in a team to perform specific experimental tasks. • Ability to work independently to handle chemicals • Ability to communicate results of work to classmate and participation in class or ab oratory discussions		• Class discussions • Research activities	• Performance on in-practical exams. • Work on research activity. • Overall student performance in Lab. discussions • Cross questions after finishing laboratory work
4.0	**Communication, Information Technology, Numerical**		
• Use information and communication technology. • The ability to use e-mail to communicate with the instructor and other students. • Scientific writing. • Use his/her observations to solve problems. • Able to calculate and discuss the facts and logical propose methods to solve the difficulties.		• Lectures • Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
5.0	**Psychomotor**		
Laboratory practice . including 1.Locate Materials Safety Data Sheets, chemicals		Practical session should include both	1.Repetition of the experiments , to reproduce

carcinogens list, and hazardous chemicals list. 2. Handle chemicals safely with a proper PPE 3. Dilute solutions, repeat analysis and calculate true result for all procedures performed as required. 4.Pipette accurately at all times 5. Titrate and weight efficiently in right way 6.Dispose the hazardous solution in right way	demonstration and experiments.	the results 2. Written report of chart and procedures. 3.The students should be able to correlate their results with experimental conditions

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
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2	Midterm Exam.	8	20 %
3	Practical Exam.	14	30 %
4	Final Exam.	16	40 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

- Douglas A. Skoog, Donald M. West, James F. Holler and Stanley R. Crouch, ***Analytical Chemistry***, 7th edition, Springer (2014)

2. List Essential References Materials (Journals, Reports, etc.)

- Lecture Hand outs available on the coordinator website

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

- Gary D. Christian, Purnendu K. Dasgupta and Kevin A. Schug, ***Analytical Chemistry***, 7th edition, WILEY (2014)

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com**
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- **http://www.rsc.org**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)
   - **Classrooms capacity (30) students.**
   - **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)
   - **Room equipped with computer and projector and TV.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)
   - **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching
Complete the questionnaire evaluation of the course in particular.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor
- **Observations and the assistance of colleagues.**
- **Independent evaluation for extent to achieve students the standards.**
- **Iindependent advice of the duties and tasks.**

3 Processes for Improvement of Teaching
- **Workshops for teaching methods.**
- **Continuous training of member staff.**
- **Review of strategies proposed.**
- **Providing new tools for learning.**
- **The application of e-learning.**
- **Eexchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: **Dr. Mohammed Kassem**

Signature: **Date Report Completed: 2015**

Received by: Dr. Ismail Althagafi **Department Head**

Signature: ________________________________ **Date:** _______________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Spectrophotometric and Electrochemical techniques

4023555-3

Course Specifications
(CS)

Course Specifications

Institution: **Umm Al-qura University** Date of Report: 2017

College/Department : **Faculty of Applied Science/ Department of Chemistry**

A. Course Identification and General Information

1. Course title and code: **Spectrophotometric and Electrochemical techniques /4023555-3**
2. Credit hours: **3 hrs** (2 theoretical + 1 practical)
3. Program(s) in which the course is offered. **Chemistry**
4. Name of faculty member responsible for the course: **Prof. Amr L Saber**
5. Level/year at which this course is offered: **5th level/3rd year**
6. Pre-requisites for this course (if any): **Volumetric analysis**
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **both on El-Abdyah, and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ☒ What percentage? 100%

b**. Blended (traditional and online)** What percentage?

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage? ☐

Comments:

B Objectives

1. What is the main purpose for this course?

By the end of this course student have all information about the instrumental analysis and have ability to determine the trace amounts of different compounds and metals.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
a. General properties of electromagnetic radiation and its interaction with matter, the electromagnetic spectrum as well as the absorption and emission of electromagnetic radiation.	2	4
b. Atomic spectra, molecular spectra, scattered radiation, refracted radiation, dispersed and diffracted radiation, monochromatic vs. polychromatic radiation.	1	2
c. Instrumentation, radiation sources, monochromators, sample cell (cuvette), detectors, single-beam and double-beam spectrophotometers and photometers.	1	2
d. Ultraviolet and visible molecular absorption spectroscopy, Beer's law, true and apparent deviations from Beer's law, application of Beer's law to mixtures, calibration curve and the standard addition method.	1	2
e. Absorbing species, absorption by organic compounds, charge-transfer absorption and ligand-field absorption bands.	1	2
f. Qualitative and quantitative analysis by UV-Vis. Applications of spectrophotometric methods in chemical equilibrium studies, spectrophotometric titrations	1	2
g. Turbidimetry and nephelometry	1	2
h. Molecular fluorescence spectroscopy, theory of molecular fluorescence, relaxation process, resonance lines and stokes shifts, relationship between excitation spectra and fluorescence spectra, effect of structure, temperature and solvents on fluorescence, effect of concentration on fluorescence intensity, instrumentation and applications in organic and inorganic analysis.	1	2

i. Flame emission and atomic absorption spectroscopy, nebulisation, burners and nebulizers, flames and flame temperature, interferences, flame spectrometric techniques, flame emission spectrometry, flame photometer, flame atomic absorption spectrometry and applications	2	4
j. Introduction to electroanalytical methods, pH and ion selective potentiometry, glass-membrane electrodes, solid-state sensors, liquid-membrane electrodes, gas-sensing and enzyme electrodes, interferences, potentiometric titrations	1	2
k. Voltammetry, polarography and amperometric titrations, current-voltage relationships, characteristics of dropping mercury electrode, half-wave potential, modern voltammetric techniques (ASV and CSV), instrumentation, applications, two indicator electrodes amperometric titrations	1	2
l. Electrogravimetry and calorimetry, basic principles, equipment for electrolytic separation, electrogravimetry, coulometry and coulometric titrations, conductance methods, electrolytic conductivity, measurement of electrolytic conductance, direct concentration determination, conductometric titrations	1	2

Labortory Part:

- Determine copper in copper sulphate solution using spectrophotometric methods
- Determine iron in its salt solution using spectrophotometric methods
- Study reduction oxidation reactions by spectrophotometric methods
- Analysis of $KMnO_4$ and $K_2Cr_2O_7$ in mixture using UV-Vis. spectrophotometer
- Determination of copper using potentiometric titration
- Potentiometric EDTA titrations with the mercury electrode
- Determination of ascorbic acid in fruit juice using Polarographic method
- Determination of amino acids in their solutions
- Determination of hydroxyl group number

II-General scheme for identification of organic aliphatic unknown

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	-	36	-	-	64
Credit	2	-	1	-	-	3

3. Additional private study/learning hours expected for students per week. 2 h

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Describe the principles and applications of spectrophotometric and colormetric analysis	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • long and short essays • posters lab manuals
1.2	Identify electromagnetic spectrum and its interaction with matter		
1.3	Define absorption and emission of light by atoms and molecules-types of analysis and devices		
1.4	Recognize the spectrophotometric measurements theory and Beer's law deviation		
1.5	Familiar with spectrophotometric instrumentation – spectra measurements using UV-vis and IR		
1.6	Outline atomic absorption by electrothermal oven- X ray analysis – Applications		
1.7	Write an atomic emission spectroscopy and the interference study		
1.8	Determine the electrochemical methods in quantitative analysis – Introduction to the principles		
1.9	Recognize the potentiometric methods and Potentiometric titrations		
1.10	Memorize voltammetry and polarography techniques		
1.11	Outline conductmetric methods and their titrations		
2.0	**Cognitive Skills**		
2.1	Analyze electromagnetic spectrum and its interaction with matter	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • posters • demonstrations
2.2	Summarize the principles and applications of spectrophotometric and colormetric analysis		
2.3	Explain the turbidity analysis and flame photometry		
2.4	Apply Beer's law applications		
2.5	Interpret the inductively coupled plasma (ICP)– principles and applications		
2.6	Compare between voltammetry and polarography techniques		
2.7	Measure using conductmetric methods and their titrations Evaluate atomic absorption by electrothermal oven- X ray analysis – Applications Demonstrate potentiometric methods and Potentiometric titrations		
3.0	**Interpersonal Skills & Responsibility**		

• Ability to work in a team to perform a specific experimental tasks. • Ability to work independently to handle chemicals • Ability to communicate results of work to classmate and participation in class or ab oratory discussions	• Class discussions • Research activities	• Performance on in-practical exams. • Work on research activity. • Overall student performance in Lab. discussions • Cross questions after finishing laboratory work
4.0 **Communication, Information Technology, Numerical**		
1. Encourage students to use internet for searching certain electronic journals regarding topics of the course. 2. Scientific writing. 3. Use his/her observations to solve problems. 4. Doing research and conduct searches for restoring information. 5. Able to calculate and discuss the facts and logical propose methods to solve the difficulties.	• Lectures • Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
5.0 **Psychomotor**		
Laboratory practice . including 1.Locate Materials Safety Data Sheets, chemicals carcinogens list, and hazardous chemicals list. 2. Handle chemicals safely with a proper PPE 3.Dilute solutions, repeat analysis and calculate true result for all procedures performed as required. 4.Pipette accurately at all times 5. Titrate and weight efficiently in right way 6.Dispose the hazardous solution in right way	Practical session should include both demonstration and experiments .	1.Repetition of the experiments , to reproduce the results 2.Written report of chart and procedures. 3.The students should be able to correlate their results with experimental conditions

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	Midterm Exam.	8	20 %
3	Practical Exam.	14	30 %
4	Final Exam.	16	40 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

- K. Danzer, ***Analytical Chemistry, Theoretical and Metrological Fundamentals***, Springer(2014)

2. List Essential References Materials (Journals, Reports, etc.)

- Lecture Hand outs available on the coordinator website

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

- Gary D. Christian, Purnendu K. Dasgupta and Kevin A. Schug, ***Analytical Chemistry***, 7th edition, WILEY (2014)
- Douglas A. Skoog, Donald M. West, James F. Holler and Stanley R. Crouch, ***Analytical Chemistry***, 7th edition, Springer (2014)
- Dhruba Charan Dash. *Analytical Chemistry* (2017) PHI Learning Private Limited.

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com**
- **http://www.sciencedirect.com**
- **http://www.rsc.org**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- **Classrooms capacity (30) students.**
- **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

- **Room equipped with computer and projector and TV.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

Complete the questionnaire evaluation of the course in particular.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- **Observations and the assistance of colleagues.**
- **Independent evaluation for extent to achieve students the standards.**
- **Independent advice of the duties and tasks.**

3 Processes for Improvement of Teaching

- **Workshops for teaching methods.**
- **Continuous training of member staff.**
- **Review of strategies proposed.**
- **Providing new tools for learning.**
- **The application of e-learning.**
- **Exchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: Prof. Amr L. Saber

Signature: Date Report Completed: 2017

Received by: Dr. Ismail Althagafi Department Head

Signature: ________________________________ Date: _______________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Environmental Chemistry

4024574-2

Course Specifications
(CS)

Course Specifications

Institution: **Umm Al-qura University** Date of Report: **2015**

College/Department : **Faculty of Applied Science/ department of chemistry**

A. Course Identification and General Information

1. Course title and code: **Environmental Chemistry / 4024574-2**
2. Credit hours: **2**
3. Program(s) in which the course is offered. **Chemistry program**
4. Name of faculty member responsible for the course: **Dr. Mohammed Kassem**
5. Level/year at which this course is offered: **6th level / 3rd year**
6. Pre-requisites for this course (if any): **separation tech and thermal analysis**
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **both on El-Abedyah, and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ☒ What percentage? **100%**

b**. Blended (traditional and online)** What percentage?

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage?

Comments:

B Objectives

1. What is the main purpose for this course?

By the end of this course the students will

1- Have all information about the basis environmental chemistry
2- Familiar with air, water and soil pollution
3- Gases cycle in the atmosphere

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
a. Introduction	1	2
b. Principles of environmental chemistry and chemical analysis	2	4
c. Energy and energy cycles and gases cycles	2	2
d. Role of human in environmental pollution	1	2
e. Atmosphere chemistry	1	2
f. Air pollution (classification-sources –problems-global warming phenomenon)	2	4
g. Water treatment chemistry	1	2
h. Water pollution (water quality- types of contaminants- water pollution control)	2	4
i. Soil chemical analysis	2	2

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	24	-		-		24
Credit	2	-		-		2

3. Additional private study/learning hours expected for students per week. 2 h

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Recognize the meaning of environment and methods in analytical chemistry related to the pollution	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • long and short essays • posters lab manuals
1.2	Identify the principles of energy resources		
1.3	Know the principles of energy cycles		
1.4	Describe some gases cycles		
1.5	Familiar with global warming phenomenon		
1.6	Select the proper method of analysis		
1.7	Name the different classes of air, water and soil pollution		
1.8	Determine principles of atmosphere chemistry		
2.0	**Cognitive Skills**		
2.1	Apply analytical methods in environmental pollution	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • posters • demonstrations
2.2	Compare different types of pollutions		
2.3	Explain the principles air, water and soil pollutions		
2.4	Analyze control methods for water , air and soil pollutions		
2.5	Summarize the principles of atmosphere chemistry		
3.0	**Interpersonal Skills & Responsibility**		
		•	•
4.0	**Communication, Information Technology, Numerical**		
4.1	Appraise the treatments for pollution in analytical chemistry	• Lectures • Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
5.0	**Psychomotor**		
5.1	NOT APPLICABLE		
5.2			

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Exams	8-14	40%
2	Assignments		10%
3			
4	Final Exam	16	50%

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

- **Donald L. Sparks**, ***Environmental Soil Chemistry***, 2nd Edition, Academic Press (2003)
- Stanley E. Manahan, ***ENVIRONMENTAL SCIENCE, TECHNOLOGY, AND CHEMISTRY,*** 2000, CRC Press LLC

2. List Essential References Materials (Journals, Reports, etc.)

- Lecture Hand outs available on the coordinator website

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

- Gary D. Christian, Purnendu K. Dasgupta and Kevin A. Schug, ***Analytical Chemistry***, 7th edition, WILEY (2014)

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com**
- **http://www.sciencedirect.com**
- **http://www.rsc.org**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- **Classrooms capacity (30) students.**
- **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

- **Room equipped with computer and projector and TV.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

Complete the questionnaire evaluation of the course in particular.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- **Observations and the assistance of colleagues.**
- **Independent evaluation for extent to achieve students the standards.**
- **Independent advice of the duties and tasks.**

3 Processes for Improvement of Teaching

- **Workshops for teaching methods.**
- **Continuous training of member staff.**
- **Review of strategies proposed.**
- **Providing new tools for learning.**
- **The application of e-learning.**
- **Exchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: **Dr. Mohammed Kassem**

Signature: **Date Report Completed: 2015**

Received by: Dr. Ismail Althagafi **Department Head**

Signature: ________________________________ **Date:** _______________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Industrial analysis and quality measurements

4024775-2
Course Specifications
(CS)

Course Specifications

Institution: **Umm Al-qura University** Date of Report:

College/Department : **Faculty of Applied Science/ department of chemistry**

A. Course Identification and General Information

1. Course title and code: **Industrial analysis and quality measurements/ 4024775-2**
2. Credit hours: **2 hrs** (1 theoretical + 1 Laboratory)
3. Program(s) in which the course is offered. **Industrial Chemistry**
4. Name of faculty member responsible for the course: **Dr, Mohammed Kassem**
5. Level/year at which this course is offered: **7th level / 4rd year**
6. Pre-requisites for this course (if any): **Separation techniques and thermal analysis**
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **El-Abdyah**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ■ What percentage? **100%**

b. Blended (traditional and online) What percentage?

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage? ☐

Comments:

B Objectives

1. What is the main purpose for this course? **The course aims to shed light on the meaning of quality in analytical chemistry and how to measure the quality of different analytical methods and identify the different tests used in it.**
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) **The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course**

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
1. Introduction about industrial color testing	1	1
2. measurement and evaluation of object colors	2	2
3. Determination of hiding power and transparency	1	1
4. Measurement of film thickness	1	1
5. Determination of tinting strength and lighting power	1	1
6. Meaning of quality and quality measurements	1	1
7. Quality in chemical analysis- Reliability in analytical chemistry	1	1
8. Quality of analytical processes and results - Establishing a new analytical procedure	1	1
9. Reporting analytical results - Analytical errors that can be detected using statistical quality control methods	1	1
10. Interlaboratory tests for process standardization	1	1
11. Quality management system of the provider of an interlaboratory test	1	1
12. Procedures for the execution and evaluation of interlaboratory	2	2

Laboratory **part:**

- Color fastness to Acids and Alkalis
- Fiber Analysis: Qualitative
- Fiber Analysis: Quantitative
- pH of the Water-Extract from Wet Processed Textiles
- Chelating Agents: Chelation Value of Aminopolycarboxylic Acids and Their Salts; Calcium Oxalate Method
- Application of significant tests for some practical experiments.
- Cement analysis

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	14	-	42			56
Credit	1	-	1			2

3. Additional private study/learning hours expected for students per week.	2 h

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	**Course Teaching Strategies**	**Course Assessment Methods**
1.0	**Knowledge**		
1.1	Define the quality in chemical analysis	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • long and short essays • posters lab manuals
1.2	Identify the principles of industrial color testing		
1.3	Know the meaning of quality and quality measurements		
1.4	Familiar with establishing a new analytical procedure		
1.5	Determine the hiding power and transparency		
1.6	Recognize procedures for the execution and evaluation of interlaboratory		
1.7	Memorize quality in chemical analysis		
1.8	Outline reports for analytical results		
1.9	Recognize measurement and evaluation of object colors		
2.0	**Cognitive Skills**		
2.1	Apply the analytical errors that can be detected using statistical quality control methods		
2.2	Compare between tinting strength and lighting power		
2.3	Explain measurement and evaluation of object colors		
2.4	Analyze the meaning of quality and quality measurements		•
2.5	Summarize the Procedures for the execution and evaluation of interlaboratory		
3.0	**Interpersonal Skills & Responsibility**		

	• Ability to work in a team to perform a specific experimental tasks. • Ability to work independently to handle chemicals • Ability to communicate results of work to classmate and participation in class or laboratory discussions	• Class discussions • Research activities	• Performance on in-practical exams. • Work on research activity. • Overall student performance in Lab. discussions • Cross questions after finishing laboratory work
4.0	**Communication, Information Technology, Numerical**		
	• Ability to solve problems. • Ability to computers and internet to search and restore information. • Use information and communication technology. • The ability to use e-mail to communicate with the instructor and other students. • Scientific writing. • Use his/her observations to solve problems.	• Lectures • Scientific discussion • Web-based study	• Exams • web-based student performance systems
5.0	**Psychomotor**		
5.1	Laboratory practice . including 1.Locate Materials Safety Data Sheets, chemicals carcinogens list, and hazardous chemicals list. 2. Handle chemicals safely with a proper PPE 3.Dilute solutions, repeat analysis and calculate true result for all procedures performed as required. 4.Dispose the hazardous solution in right way	Practical session should include both demonstration and experiments .	1.Repetition of the experiments , to reproduce the results 2.Written report of chart and procedures. 3.The students should be able to correlate their results with experimental conditions
5.2			
	NOT APPLICABLE		

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	Midterm Exam.	8	20 %
3	Practical Exam.	14	30 %
4	Final Exam.	16	40 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks
- Hans G. Volz, ***Industrial color testing, Fundamentals and techniques***, 2nd Edition, Wiley(2002)

2. List Essential References Materials (Journals, Reports, etc.)
- Lecture Hand outs available on the coordinator website

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)
- W. Funk, V. Dammann, G. Donnevert, ***Quality Assurance in Analytical Chemistry,*** 2007 WILEY-VCH
- Gary D. Christian, Purnendu K. Dasgupta and Kevin A. Schug, ***Analytical Chemistry***, 7th edition, WILEY (2014)
- Dhruba Charan Dash. *Analytical Chemistry* (2017) PHI Learning Private Limited.

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)
- **http://www.chemweb.com**
- **http://www.sciencedirect.com**
- **http://www.rsc.org**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)
    - **Classrooms capacity (30) students.**
    - **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

- **Room equipped with computer and projector and TV.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

Complete the questionnaire evaluation of the course in particular.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- **Observations and the assistance of colleagues.**
- **Independent evaluation for extent to achieve students the standards.**
- **Iindependent advice of the duties and tasks.**

3 Processes for Improvement of Teaching

- **Workshops for teaching methods.**
- **Continuous training of member staff.**
- **Review of strategies proposed.**
- **Providing new tools for learning.**
- **The application of e-learning.**
- **Exchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff**

member for the same course in other faculty.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. • **Periodic Review of the contents of the syllabus and modify the negatives.** • **Consult other staff of the course.** • **Hosting a visiting staff to evaluate of the course.** • **Workshops for teachers of the course.**

Faculty or Teaching Staff: **Dr, Mohammed Kassem**

Signature: **Date Report Completed: 2017**

Received by: Dr. Ismail Althagafi **Department Head**

Signature: ________________________________ **Date:** _______________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Water Treatment

4024773-1

Course Specifications
(CS)

Course Specifications

Institution: **Umm Al-qura University** Date of Report: **2017**

College/Department : **Faculty of Applied Science/ department of chemistry**

A. Course Identification and General Information

1. Course title and code: **Water Treatment/ 4024773-1**
2. Credit hours: **1**
3. Program(s) in which the course is offered. **Industrial Chemistry program**
4. Name of faculty member responsible for the course: **Prof. Amr L. Saber**
5. Level/year at which this course is offered: **7th level/4th year**
6. Pre-requisites for this course (if any): **Spectrophotometric and Electrochemical techniques**
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **El-Abdyah**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ☒ What percentage? **100%**

b**. Blended (traditional and online)** What percentage

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage? ☐

Comments:

B Objectives

1. What is the main purpose for this course?

By the end of this course student will be:

1. **Know different water sources and its ability to renew**
2. **Familiar with quality control and environmental pollutions and effect of the pollutants on human health**
3. **Able to treat waste water using different methods and tests of significance**

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
a. Requirement of water and sources	1	1
b. Water quality standards	1	1
c. Physico chemical parameters and significance-odor-temperature turbidity, density, solids, hardness, acidity and alkalinity	1	1
d. Dissolved oxygen-organic chemicals, solid substances and secondary drinking water standards	1	1
e. Determination of pH, CO_2, alkalinity (carbonate, bicarbonate)	1	1
f. Determination of hydroxide, chloride, fluoride, sulphate, and H_2S.	1	1
g. Determination of calcium, magnesium, sodium, potassium, iron (total ferrous and ferric), ammonia, nitrite and nitrate	1	1
h. Determination of phosphorous (total inorganic and organic), phenols, surfactants and pesticides	1	1
i. Mid term exam	1	1
j. Aim of water treatment	1	1
k. A brief idea of sedimentation, coagulation and flocculation	1	1
l. Water purification processes, corrosion and its control	1	1
m. Removal of toxic compounds, refractory organics, dissolved inorganic substances and different methods for water treatment	1	1
n. General revision and exam	1	1

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	14	-	-	-	-	14
Credit	2	-	-	-	-	1

3. Additional private study/learning hours expected for students per week. 2 h

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	**Course Teaching Strategies**	**Course Assessment Methods**
1.0	**Knowledge**		
1.1	Know different water sources, quality control and data handling in analytical chemistry techniques and how to select the optimum samples	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • long and short essays
1.2	Recognize the industrial pollutions present in water		
1.3	Describe analytical chemistry in manufactures and found way for purification and corrosion control		
1.4	Familiar with the separation methods for separate the pollutants		
1.5	Write selective industrial applications		
2.0	**Cognitive Skills**		
2.1	Develope the reverse think skills and predict the suitable methods for industrial pollutants separation from water samples	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • posters • demonstrations
2.2	Create the different ideas for water treatment		
2.3	Explain the methods and ways of analytical chemistry – environmental analytical chemistry to remove industrial pollutions		
2.4	Explain the suitable method to determine the organic and inorganic pollutants in different water samples		
2.5	Plan for research program in water treatment field		
2.6	Create briefly ideas for sedimentation, coagulation and flocculation Illustrate the suitable methods of water analysis in analytical chemistry and tests of significance Evaluate the optimal parameters to select the best analytical methods		

3.0	**Interpersonal Skills & Responsibility**		
4.0	**Communication, Information Technology, Numerical**		
	• Enhancing the ability of students to use computers and internet. • Interpret chemical data • Present chemical data orally. • Know how to write a report.	• Lectures • Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
5.0	**Psychomotor**		
5.1	NOT APPLICABLE		
5.2			

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	First Periodic Exam.	6	20 %
3	Second Periodic Exam.	12	20 %
4	Final Exam. (2hours exam)	16	50 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

- R. Kellner, J. M. Mermet, M. Otto, M. Valcarcel and H. M. Widmer, *Analytical Chemistry*, 2nd edition, WILEY (2014)
- K. Danzer, *Analytical Chemistry, Theoretical and Metrological Fundamentals*, Springer(2014)
- Industrial water pollution control, 3rd ed, W. Wesley Eckenfelder, Jr., McGraw-Hill, Inc., 2000

2. List Essential References Materials (Journals, Reports, etc.)

- Lecture Hand outs available on the coordinator website

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

- Gary D. Christian, Purnendu K. Dasgupta and Kevin A. Schug, *Analytical Chemistry*, 7th edition, WILEY (2014)
- Douglas A. Skoog, Donald M. West, James F. Holler and Stanley R. Crouch, *Analytical Chemistry*, 7th edition, Springer (2014)
- Dhruba Charan Dash. *Analytical Chemistry* (2017) PHI Learning Private Limited.

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com**
- **http://www.sciencedirect.com**
- **http://www.rsc.org**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- **Classrooms capacity (30) students.**
- **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

- **Room equipped with computer and projector and TV.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching Complete the questionnaire evaluation of the course in particular.
2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor • **Observations and the assistance of colleagues.** • **Independent evaluation for extent to achieve students the standards.** • **Iindependent advice of the duties and tasks.**
3 Processes for Improvement of Teaching • **Workshops for teaching methods.** • **Continuous training of member staff.** • **Review of strategies proposed.** • **Providing new tools for learning**. • **The application of e-learning.** • **Eexchange of experiences internal and external.**
4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) • **Check marking of a sample of exam papers, or student work.** • Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. • **Periodic Review of the contents of the syllabus and modify the negatives.** • **Consult other staff of the course.** • **Hosting a visiting staff to evaluate of the course.** • **Workshops for teachers of the course.**

Faculty or Teaching Staff: **Prof. Amr L Saber**
Signature: **Date Report Completed: 2017**

Received by: Dr. Ismail Althagafi **Department Head**

Signature: ________________________________ Date: _______________

B- Physical Chemistry Courses

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

COURSE SPECIFICATION

General Chemistry 1

4021101-4

1436 / 1437 H

Course Specification

Institution: Umm Al-Qura University

College/Department: Faculty of Applied Sciences / Chemistry Department

A. Course Identification and General Information

1. **Course title and code:** General Chemistry 1, 4021011-4
2. **Credit hours:** Four (3 theoretical + 1 practical) hrs.
3. **Program(s) in which the course is offered (If general elective available in many programs indicate this rather than list programs):**
   - **Chemistry**
   - **Industrial Chemistry**
   - **Physics**
   - **Medical Physics**
   - **Biology**
   - **Microbiology**
   - **Mathematics**
4. **Name of faculty member responsible for the course:**
   Prof. Mohamed Ismail Awad
5. **Level/year at which this course is offered:** 1st / 1
6. **Pre-requisites for this course (if any): ---------**
7. **Co-requisites for this course (if any): ---------**
8. **Location if not on main campus: ---------------**

B. Objectives

1. Summary of the main learning outcomes for students enrolled in the course.

This course is an introductory chemistry course designed to prepare students for college level chemistry courses. The course introduces some basic principles of physicl, organic and inorganic chemistry.

2.Briefly describe any plans for developing and improving the course that are being implemented. (eg increased use of IT or web based reference material, changes in content as a result of new research in the field).

- The use of teaching intelligent classes for lectures.
- Encourage students to prepare reports in general topics in chemistry.
- The use ofinformation technology orthe Internetin order to increaseawarenessof the conceptsof

chemistry.

- Link the theoretical and practical sides of the course to help the students to understand and interpret the properties of the chemical compounds.

C. Course Description:(Note: General description in the form to be used for the Bulletin or Handbook should be attached).

1. Topics to be Covered		
Topic	No of Weeks	Contact hours
Units of measurements; SI- units, intensive and extensive properties, uncertainty in measurements (precision and accuracy).	1	3
Significant figures: Rounding significant figures, Using significant figures in addition, subtraction, multiplication and divisions.	1	3
States of matter and measurement, molecules and molecular compounds.	2	6
The periodic table, nomenclature, electronic structure of atoms, simple periodic properties of the elements.	2	6
Chemical bonding, molecular geometry, and properties of various states of matter.	1	3
Ions and ionic compounds, chemical reaction types.	1	3
Stoichiometry, atomic and molecular weights.	1	3
The mole, simple quantitative calculations with chemical reactions.	1	3
Basics of chemical equilibrium.	1	3
Acids and bases.	1	3
Thermochemistry.	1	3
Hydrocarbons, nomenclature and simple reactions.	1	3

Laboratory Experiments Outline

Topics to be Covered		
List of Experiments The practical part includes the following experiments:	No of Weeks	Contact hours
Introduction	**1**	**3**
Density and viscosity of liquids.	**1**	**3**
Compound type (polar – nonpolar – ionic).	**1**	**3**
Chemical reactions.	**1**	**3**
Acids and bases and pH measurements and calculations.	**1**	**3**
Titration of vinegar.	**1**	**3**

Oxidation-reduction reactions.	**1**	**3**
Molar mass of acid.	**1**	**3**
Qualitative analysis (acidic and basic radicals).	**1**	**3**
Collegative properties (determination of molecular weight).	**1**	**3**
Determination of the heat capacity of the calorimeter.	**1**	**3**
Determination of the critical solution temperature of phenol - water system	**1**	**3**
Review	**1**	**3**
Final Exam.	**1**	**3**

2. Course components (total contact hours per semester):

Lecture:	Tutorial:	Practical/Fieldwork/Internship:	Other:
42	---	**42**	

3. Additional private study/learning hours expected for students per week. (This should be an average: for the semester not a specific requirement in each week)
- 28 hours (2 hrs per week office hrs).

4. Development of Learning Outcomes in Domains of Learning
For each of the domains of learning shown below indicate:
A brief summary of the knowledge or skill the course is intended to develop;
A description of the teaching strategies to be used in the course to develop that knowledge or skill.
The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

Knowledge

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0			
1.1	Knows International system of units	Lectures Scientific discussion Library visits Web-based study	Exams portfolios long and short essays posters lab manuals
1.2	Familiar with the laws that describe the behavior of ideal gases.		
1.3	Knows atom structure		
1.4	Describe types of solids.		
1.5	Mention the first law of thermodynamics.		
1.6	List the factors affecting equilibrium position and equilibrium concentration.		
2.0	Cognitive Skills		

2.1	Summarize gases laws	Lectures Scientific discussion homework assignment containing problem thinking activities	1. Midterm exam 2.quizzes 3.Final exam	
2.2	Compare between ideal and real gases			
2.3	Apply Hess's law for the calculation of heat of reaction.			
2.4	Apply Faraday's laws for calculating the amount deposited at electrodes			
2.5	Predict the spontaneity of chemical reaction.			
3.0	Interpersonal Skills & Responsibility			
	• Manage resources, time and collaborate with members of the group. • Ability to work independently to handle Chemicals and perform laboratory illustrations safely. • Ability to communicate results of work to classmates. • Ability to work in a team to perform a specific task	Team work groups General discussion with students for solving a problrm.	Assessment of the solution of problems submitted by the students.	
4.0	Communication, Information Technology, Numerical			
	• Work effectively both in a team, and independently on solving chemistry problems. • Communicate effectively with his lecturer and colleagues • Use university library and web search engines for collecting information and search about different topics .	Write a Report Use libraries	Evaluation of the report presented	
5.0	Psychomotor			
5.1	NOT APPLICABLE			
5.2				

5. Schedule of Assessment Tasks for Students During the Semester:			
Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Proportion of Final Assessment
1	Class activities, Attendances and Duties	Throughout the Term	10%
2	Mid-Term Exam (s)	5-14	20%
3	Lab Activity and Final Exam on Lab	Throughout the Term	30%
4	Final Exam	End of the Term	40%
5	Total		100%

D. Student Support

1. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)
Presence of faculty members to provide counselling and advice.

Office Hours: weekly during working hours, and to create appropriate means.
Academic Advising for students to those who need it, and taking into account the appropriate test for that Member.

E Learning Resources

1. Required Text(s)
P. Atkins and J. de Paula, Physical Chemistry, 10th ed., 2006, New York.

2. Essential References
Steven S. Zumdahl, Susan A. Zumdahl, 9th ed., 2009, New York.

3. Recommended Books and Reference Material (Journals, Reports, etc) (Attach List)
Chemistry, R. Chang, 10th Edition, McGraw-Hill Higher Education, 2011.

4. Electronic Materials, Web Sites etc
Power point lectures.

5. Other learning material such as computer-based programs/CD, professional standards
Microsoft PowerPoint, Microsoft Word

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Lecture rooms, laboratories, etc.)
Classroom capacity (60) students.
To supply the classrooms with the appropriate educational means.

2. Computing resources
Hall is equipped with a computer and Data Show and TV.

3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)
None

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching
Complete thequestionnaireevaluation of the coursein particular.

Assess the progress of the operation by the students using the evaluation forms or group discussion in order to reach weaknesses and processed.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor
Observationsandthe assistance ofcolleagues.
Independent evaluation forextent toachieve students the standards.
Iindependent adviceofthe dutiesandtasks.

3 Processes for Improvement of Teaching
- Workshopsforteaching methods.

- Continuous trainingofmember staff.
- Review of strategies proposed.
- Providing new tools for learning.
- The application ofe-learning.
- Exchange of experiencesinternal andexternal.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- Check markingof a sampleofexam papers, orstudent work.
- Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- Periodic Reviewof thecontents ofthe syllabusandmodify thenegatives.
- Consultotherstaff ofthe course.
- Hostinga visiting staffto evaluate of thecourse.
- Workshopsfor teachers ofthe course.

Faculty or Teaching Staff: **Professor Mohamed Awad**

Signature: **Date Report Completed: March 2016**

Received by: Dr. Ismail Althagafi **Department Head**

Signature: ________________________________ **Date: _______________**

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Thermodynamics

4022135-3

**Course Specifications
(CS)**

Course Specifications

Institution: **Umm Al-qura University**	Date of Report: **2016**
College/Department : **Faculty of Applied Science/ department of chemistry**	

A. Course Identification and General Information

1. Course title and code: **Thermodynamics** / **4022135-3**
2. Credit hours: **3 (2 theoretical + 1 practical)**
3. Program(s) in which the course is offered. **Chemistry**
4. Name of faculty member responsible for the course: **Professor Alaa El-Shafei**
5. Level/year at which this course is offered: **3rd level/2nd year**
6. Pre-requisites for this course (if any): **Volumetric Analytical Chemistry & Calculus**
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **both on El-Abedyah and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ☒ What percentage? 100%

b. **Blend (traditional and online)** What percentage

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage? ☐

Comments:

B Objectives

1. What is the main purpose for this course? **By the end of this course the students will be able to:** **1. Describe the fundamental principles of thermodynamics.** **2. State the fundamental application of thermodynamic laws in various fields** **3. Develop physical intuition, mathematical reasoning, and problem solving skills.** **4. Analyze the thermodynamic data and predict the processes spontaneity**
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) **The students will be asked to prepare an essay or a report according to the literature survey using the library, data base services, and/or websites to follow up and update the topics related to the subject of the course**.

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact Hours
Theoretical part		
1. General introduction: objectives of the thermodynamics, some thermodynamics terms	1	2
2. Heat, energy and work (the mechanical equivalent of heat). Different types of systems	1	2
3. Thermodynamics variables and characteristics of intensive, extensive and thermodynamics processes.	1	2
4. Zero and first laws of thermodynamics and their applications	1	2
5. The relationship between enthalpy change and internal energy change, heat capacity	1	2
6. The Jules-Thompson's effect, Adiabatic and isothermal expansions, Determination of Joule's coefficient from heat capacity measurements.	1	2
7. Thermochemistry. Exothermic and endothermic reactions. Kirchhoff's law, Hess's law and its applications.	1	2
8. The second law of thermodynamics and its applications.	1	2
9. Spontaneous and non spontaneous processes. Heat machines and thermal efficiency		

10. Heat transfer to work. Carnot cycle (efficiency and compression ratio) Otto cycle.	1	2
11. Entropy. Gibbs free energy, work function, Gibbs and Gibbs – Helmholtz Equations.	1	2
12. Van't Hoff Equations, Chemical Equilibrium and spontaneity.	1	2
13. Third law of thermodynamics and its applications.	1	2
14. General revision	1	2
Laboratories		
• Instructions on rules and methods of safety at chemical lab.	1	3
• Introduction to the objectives of thermodynamics and various types of thermo-chemical reactions.	1	3
• Determination of the heat capacity and specific heat of the calorimeter using distilled water.	1	3
• Determination of the heat capacity of the calorimeter using solutions.	1	3
• Determination of the heat capacity for different concentration of sodium chloride solutions.	1	3
• Determination of the heat of neutralization between acid and alkali.	1	3
• Determination of the heat of salvation of ammonium chloride as an endothermic reaction at infinite dilution.	1	3
• Determination of the heat of salvation of sodium hydroxide as an exothermic reaction at infinite dilution.	1	3
• Hess's Law.	1	3
• Determination of the higher critical temperature for water-phenol system.	1	3
• Determination of the lower critical temperature in two component system.	1	3
• Three component systems.	1	3

• General revision	1	3
• Final practical exam	1	3

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	-	42			70
Credit	2	-	1			3

3. Additional private study/learning hours expected for students per week. 2hr

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	**Course Teaching Strategies**	**Course Assessment Methods**
1.0	**Knowledge**		
1.1	Recognize the intensive and extensive properties	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • long and short essays • posters • lab manuals
1.2	Know the classifications of thermodynamic systems		
1.3	Describe Joul and Joul-Thompson effects		
1.4	Familiar with systems and various dynamic processes.		
1.5	Identify the different thermodynamics functions		
1.6	Write thermal equations for various thermodynamic processes.		
1.7	Determine the relationship between chemical equilibrium and spontaneity.		
1.8	Memorize different laws of thermodynamics		
1.9	Outline the different uses of thermodynamics functions		
1.10	Define exothermic and exothermic reactions		
2.0	**Cognitive Skills**		
2.1	Apply the thermodynamic laws	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • posters
2.2	Compare between various thermodynamic systems		
2.3	Explain the conversion of heat to work		
2.4	Analyze the thermodynamic data		
2.5	Predict the spontaneity of the reactions		

2.6	Evaluate the efficiency of various heat engines		• individual and group presentations
3.0	**Interpersonal Skills & Responsibility**		
3.1 3.2	• Ability to work in a team to perform a specific experimental tasks. • Ability to work independently to handle chemicals • Ability to communicate results of work to classmate and participation in class or laboratory discussions	• Class discussions • Research activities	• Performance on in-practical exams. • Work on research activity. • Overall student performance in Lab. discussions • Cross questions after finishing laboratory work
4.0	**Communication, Information Technology, Numerical**		
4.1	Work effectively both in a team, and independently on solving chemistry problems.	• Scientific discussion • Library visits • Web-based study	• web-based student performance systems • Individual and group presentations.
4.2	Communicate effectively with his lecturer and colleagues		
4.3	Use IT and web search engines for collecting information**.**		
5.0	**Psychomotor**		
5.1 5.2	Laboratory practice . including 1.Locate Materials Safety Data Sheets, chemicals carcinogens list, and hazardous chemicals list. 2. Handle chemicals safely with a proper PPE 3.Dilute solutions, repeat analysis and calculate true result for all procedures performed as required. 4.Dispose the hazardous solution in right way	Practical session should include both demonstration and experiments .	1.Repetition of the experiments , to reproduce the results 2.Written report of chart and procedures. 3.The students should be able to correlate their results with experimental conditions

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment

1	Homework or activities.	--	10 %
2	Midterm Exam.	8	20 %
3	Practical Exam.	14	30 %
4	Final Exam.	16	40 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

- . الكيمياء الفيزيائية: J. Berro ترجمة أحمد محمد عزام واخرون – مكتبة الانجلو المصرية 1982م
- B. S. Bahl, Advanced Physical Chemistry, S. Chand & Co., 1993, New Delhi, India.
- R. A. Alberty and R. J. Silbey, Physical Chemistry, 1992, John Wiley & Sons.
- J. P. Bromberg, Physical Chemistry, 1980, Allyn and Bacon.
- P. Atkins and J. de Paula, Physical Chemistry, 7 th ed., Oxford University press, New York, 2014.

2. List Essential References Materials (Journals, Reports, etc.)

- Lecture Hand outs available on the coordinator website

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

- Thermodynamics: an engineering approach, Yunus A. Cengel and Michael A. Boles, 7 th. SI ed., McGraw- Hill, London, 2011.

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com**
- **http://www.sciencedirect.com**
- **http://www.rsc.org**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)
   - **Classrooms and lab of capacity (30) students.**
   - **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

   - **Rooms equipped with computer and projector and TV.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)
   - **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching
Complete the questionnaire evaluation of the course in particular.

Assess the progress of the operation by the students using the evaluation forms or group discussion in order to reach weaknesses and processed.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor
- **Observations and the assistance of colleagues.**
- **Independent evaluation for extent to achieve students the standards.**
- **Iindependent advice of the duties and tasks.**

3 Processes for Improvement of Teaching
- **Workshops for teaching methods.**
- **Continuous training of member staff.**
- **Review of strategies proposed.**
- **Providing new tools for learning.**
- **The application of e-learning.**
- **Exchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: Professor Alaa El-Shafei

Signature: **Date Report Completed: March 2016**

Received by: Dr. Ismail Althagafi Department Head

Signature: ________________________________ **Date:** _______________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Kinetic Chemistry

4022144-3

Course Specifications

(CS)

Course Specifications

Institution: **Umm Al-Qura University**   Date of Report: **2015**

College/Department : **Faculty of Applied Science/ Department of Chemistry**

A. Course Identification and General Information

1. Course title and code: **Kinetic Chemistry / 4022144-3**
2. Credit hours: **3 (2 theoretical + 1 practical)**
3. Program(s) in which the course is offered. **Chemistry program**
4. Name of faculty member responsible for the course: **Dr. Ahmed Fawzy Saad**
5. Level/year at which this course is offered: **5th level/3rd year**
6. Pre-requisites for this course (if any): **Thermodynamics + Volumetric and Gravimetric Analytical Chemistry**
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **both on El-Abedyah and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom	■	What percentage?	**100%**
b. Blended (traditional and online)		What percentage?	
c. e-learning	☐	What percentage?	☐
d. Correspondence	☐	What percentage?	☐
f. Other	☐	What percentage?	☐

Comments:

B Objectives

1. What is the main purpose for this course?

By the end of this course the students will be able to:

1. Describe the principles of kinetic chemistry.
2. Follow a reaction by different techniques.
3. Determine the rate law from the experimental data.
4. Analyze the experimental data of a given reaction.
5. Write the sequence of the elementary steps "mechanism" of a reaction.
6. Describe the fundamentals of catalysis and influence of the catalysts on the reaction rate.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

1. Encourage students to make reports in the field of kinetic chemistry from the library or using the Internet.
2. Use the websites to follow up and update the new topics of the subject of the course.

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
General concepts in chemical kinetic – reaction rate – rate laws – reaction order – half-life time.	**1**	**2**
Factors affecting the rate of reaction.	**1**	**2**
Conventional techniques of following a reaction: chemical methods - physical methods.	**1**	**2**
Integration of simple rate laws: zero, first, second and third order reactions and examples.	**1**	**2**
Pseudo-first order reactions - fractional order reactions – higher order reactions and examples.	**1**	**2**
General revision and Mid-Term Exam.	**1**	**2**
Determining the rate law from experimental data: Isolation method - Differential methods - Integral methods – Method of Half lives.	**1**	**2**
Dependence of rate on temperature - The Arrhenius equation and activation energy.	**1**	**2**
Theories of chemical reactions - collision theory, transition-state theory.	**1**	**2**
Kinetics of complex reactions.	**1**	**2**
Effect of catalyst on the reaction rate.	**1**	**2**
Kinetics of catalysis by enzymes.	**1**	**2**
Kinetics of photochemical reactions.	**1**	**1**
Kinetics of reactions in solutions.	**1**	**2**

Laboratory Part:

1. Catalytic decomposition of hydrogen peroxide as a first order reaction.
2. Hydrolysis of ester as pseudo-first order reaction.
3. Saponification of ester as a second order reaction.
4. Persulfate-iodide reaction.
5. Oxidation of hydrogen peroxide to determine the order and the thermodynamic parameters.
6. Halogenation of acetone in solution as a zero order reaction.
7. Autocatalytic reaction between potassium permanganate and oxalic acid.

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	-	42		-	70
Credit	2	-	1		-	3

3. Additional private study/learning hours expected for students per week. 2hr

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	**Course Teaching Strategies**	**Course Assessment Methods**
1.0	**Knowledge**		
1.1	List the conventional techniques of following a reaction and select the appropriate one to the given reaction.	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • long and short essays • posters lab manuals
1.2	Mention the different reaction orders and their rate laws.		
1.3	Define the reaction rate constant of various reaction orders.		
1.4	List the factors affecting the reaction rate.		
1.5	List the different types of complex reactions and their rate laws.		
1.6	Explain the catalysis and its effect on the reaction rate.		
1.7	Explain the kinetics and mechanism of enzymatic reactions.		
1.8	Explain the kinetics and mechanism of photochemical reactions.		
1.9	Describe the factors affecting the reactions in solutions and the kinetics of these reactions.		

2.0	**Cognitive Skills**		
2.1	Compare between the different experimental techniques of following a reaction.	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • posters • demonstrations
2.2	Solve the rate-law expressions for different reaction orders.		
2.3	Solve the kinetic problems for all orders.		
2.4	Give a concise interpretation of the mechanism of various reactions.		
3.0	**Interpersonal Skills & Responsibility**		
3.1	• Ability to work in a team to perform a specific experimental tasks. • Ability to work independently to handle chemicals • Ability to communicate results of work to classmate and participation in class or laboratory discussions	• Class discussions • Research activities	• Performance on in-practical exams. • Work on research activity. • Overall student performance in Lab. discussions • Cross questions after finishing laboratory work
3.2			
4.0	**Communication, Information Technology, Numerical**		
4.1	Work effectively both in a team, and independently on solving chemistry problems.	• Lectures • Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
4.2	Communicate effectively with his lecturer and colleagues		
5.0	**Psychomotor**		
5.1	Laboratory practice . including 1.Locate Materials Safety Data Sheets, chemicals carcinogens list, and hazardous chemicals list. 2. Handle chemicals safely with a proper PPE 3.Dilute solutions, repeat analysis and calculate true result for all procedures performed as required. 4.Pipette accurately at all times 5.Dispose the hazardous solution in right way	Practical session should include both demonstration and experiments .	1.Repetition of the experiments , to reproduce the results 2.Written report of chart and procedures.
5.2			

			3.The students should be able to correlate their results with experimental conditions

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	Midterm Exam.	8	20 %
3	Practical Exam.	14	30 %
4	Final Exam.	16	40 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- We have faculty members to provide counselling and academic advice.
- 2 hours per week as office hours are available for discussion with the students.

E. Learning Resources

1. List Required Textbooks

*** An Introduction to Chemical Kinetics, Margaret Robson Wright, New York, John Wiley & Sons, 2004.**

*** Kinetics of Chemical Reactions, Guy Marin, Gregory S. Yablonsky, John Wiley, 2011.**

*** Chemical Kinetics, Luis Arnaut, Sebastiao Formosinho, Hugh Burrows, 1st ed., Elsevier Science, 2006.**

2. List Essential References Materials (Journals, Reports, etc.)

*** Lecture Hand outs available on the coordinator website.**

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

*** Physical Chemistry, Amazon logo *Silbey, R. R. Alberty*, *M. Bawendi, 4th ed., John Wiley & Sons, 2004.***

*** Physical Chemistry, Peter Atkins & Julio de Paula, 10*th ed., W. H. Freeman* and *Company, 20*14.**

*** Principles of Chemical Kinetics, Second Edition, James E. House, 2nd ed., Academic Press, 2007.**

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http//:en.wikipedia.org/wiki/**
- **http//:www.chemweb.com/**
- **Websites on the internet relevant to the topics of the course**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

* Appropriate teaching class including white board and data show with at least 25 seats.

* Chemistry laboratories.

2. Computing resources (AV, data show, Smart Board, software, etc.)

* Computer Halls access for the students will be helpful in doing their tasks during the course.

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

* No other requirements.

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Student discussion with the instructor allow for continuous feed back through the course progress.
- Student Evaluation Questionnaires.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- Discussions within the group of faculty teaching the course.
- Peer consultation on teaching strategies and its effectiveness.

3 Processes for Improvement of Teaching

- Workshops given by experts on new teaching and learning methodologies will be attended.
- Improving of the teaching strategies by monitoring the evaluation of the students progress through the semester

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

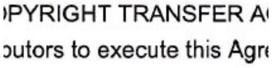
* Not effective yet.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- The course will be evaluated periodically after each semester based on the results of the students and the report presented by the teaching stuff that will be discussed with the course coordinator so as to improve the course.

Faculty or Teaching Staff: Dr. Ahmed Fawzy

Signature:



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Date Report Completed: 2016

Received by: Dr. Ismail Althagafi **Department Head**

Signature: ________________________________ **Date:** ________________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specifications
(CS)

Quantum Chemistry and Spectroscopy

4023765-2

Course Specifications

Institution: **Umm Al-qura University** Date of Report: **2016**

College/Department : **Faculty of Applied Science/ Department of chemistry**

A. Course Identification and General Information

1. Course title and code: **Quantum Chemistry and Spectroscopy/ 4023765-2**
2. Credit hours: **2 hours (theoretical)**
3. Program(s) in which the course is offered. **Industrial Chemistry**
4. Name of faculty member responsible for the course: **Dr Jaber Al-Fahemi**
5. Level/year at which this course is offered: **7th level/3rd year**
6. Pre-requisites for this course (if any): **General chemistry + Thermodynamics**
7. Co-requisites for this course (if any) -
8. Location if not on main campus: **El-Abdyah**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom	■	What percentage?	100%
b. Blended (traditional and online)	☐	What percentage?	
c. e-learning	☐	What percentage?	
d. Correspondence	☐	What percentage?	
f. Other	☐	What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course?

By the end of this course the students will be able to:

1. describe the fundamental principles of quantum chemistry.
2. State the fundamental postulates of quantum mechanics.
3. develop physical intuition, mathematical reasoning, and problem solving skills.
4. apply quantitative reasoning and problem-solving skills with quantum chemistry as a context to explain the different types of molecular spectra.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

1. Computer labs to be used in teaching the student the basics of the application of the quantum chemistry soft ware used in the simulation, molecular modeling and quantum chemical calculations.
2. encourage students to make reports in the recent trends in the field of quantum chemistry, either from the library or by using the Internet.

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Basics of Quantum Theory – Introduction to Quantum Mechanics And Its Origin – Properties of Wave Function.	2	2
Solution of Schrödinger Equation – Applications of Schrödinger Equation - A Particle Moving in A Box With Different, One – Two – Three, Dimensions - Predict the Wave Function Equation and the Energy in Each Case.	2	4
Operators and its Importance in Quantum Chemistry - Eigen Functions and Eigen Values	1	2
Schrödinger Equation Of Hydrogen Atom- Wave Function Equation and Energy	2	4
Different Quantum Numbers and their Uses in Describing the Orbitals and the Energy Levels.	1	2
Quantum Theory and Molecular Structure – Born-Oppenheimer Approximation.	1	2
Introduction to molecular structure and electromagnetic radiation	1	2
Rotational spectra- Rigid rotor	1	2
Vibrational spectra – harmonic oscillator	1	2
Electronic spectra	1	2
NMR	1	2

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	-	-	-	-	28
Credit	2	-	-	-	-	2

3. Additional private study/learning hours expected for students per week.	2hr

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	**Course Teaching Strategies**	**Course Assessment Methods**
1.0	**Knowledge**		
1.1	List the historical development of the Origins of quantum theory	1.Lectures using white board and data show 2. Problem classes 3. discussion groups	1.Midterm exam 2.quizzes 3.Group discussion 4.Final exam
1.2	Illustrate, qualitatively and quantitatively, the role of photons in understanding phenomena like the photoelectric effect and Compton scattering.		
1.3	describe the experiments displaying wave like behavior of matter, and how this motivates the need to replace classical mechanics by a wave equation of motion for matter (the Schrödinger equation).		
1.4	mention the basic concepts and principles of quantum mechanics: The Schrödinger equation, the wave function and its physical interpretation, Eigen values and Eigen functions, expectation values and uncertainty.		
1.5	define the concepts of spin and angular momentum, as well as their quantization- and addition rules.		
1.6	recognize the meaning of Electromagnetic radiation		
1.7	identify the absorption spectra in the microwave and infrared region		
2.0	**Cognitive Skills**		
2.1	Give concise physical interpretations and discussions of quantum mechanics postulations in molecular orbitals treatment.	1. group discussions 2. case study. 3. home work assignment containing problem thinking activities	1.Midterm exam 2.quizzes 3.Group discussion 4.Final exam
2.2	solve the Schrödinger equation for simple one-dimensional systems and conclude the probabilities, Eigen and expectation		

	values for these systems.		
2.3	compare between the different energies of the rigid rotors and harmonic oscillator models based on the solution of their Schrödinger equation.		
2.4	analyze the spectra of different region of electromagnetic radiation based on quantum chemical aspects.		
3.0	**Interpersonal Skills & Responsibility**		
3.1	NOT APPLICABLE		
3.2			
4.0	**Communication, Information Technology, Numerical**		
4.1	Work effectively both in a team, and independently on solving chemistry problems.	1.Write a Report 2.Use digital libraries and/or E-Learning Systems for the communication with lecturer through the course work	1.Evaluating the activities of the students through the semester for their activities on the E-learning system, as well as, their communication with each other in different tasks. 2.Evaluation of the report presented
4.2	Communicate effectively with his lecturer and colleagues		
4.3	Use IT and web search engines for collecting information**.**		
5.0	**Psychomotor**		
5.1	NOT APPLICABLE		

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	First Periodic Exam.	6	20 %
3	Second Periodic Exam.	12	20 %
4	Final Exam.(2HOURS EXAM)	16	50 %

5	**Total**	**100 %**

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week) • We have faculty members to provide counseling and academic advice. • 2 hours per week as office hours are available for discussion with the students.

E. Learning Resources

1. List Required Textbooks 1- Ajit J Thakkar, Quantum Chemistry, Morgan & Claypool Publishers, 2014. 2- Donald A. McQuarrie, Quantum Chemistry, University Science Books, 2008.
2. List Essential References Materials (Journals, Reports, etc.) journal of Molecular Structure (Elsevier)
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc) 1- Peter Atkins and Ronald Friedman, Molecular quantum mechanics, 4th edition, oxford University press, 2005. 2- Donald Allan Mc quarrie, Quantum Chemistry, 3rd Edition, University Science Books, 2012.
4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.) • http//:en.wikipedia.org/wiki/ • http//:www.chemweb.com/ • Websites on the internet relevant to the topics of the course
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software. Hyperchem or Spartan software will be helpful beside some free software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) Appropriate teaching class including white board and data show with at least 25 seats.

2. Computing resources (AV, data show, Smart Board, software, etc.) Computer Halls access for the students will be helpful in doing their tasks during the course.
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) Computational software will be helpful such as Spartan or hyperchem program packages.

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching
• Student discussion with the instructor allow for continuous feed back through the course progress. • Student Evaluation Questionnaires.
2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor
• Discussions within the group of faculty teaching the course. • Peer consultation on teaching strategies and its effectiveness.
3 Processes for Improvement of Teaching
• Workshops given by experts on new teaching and learning methodologies will be attended. • Improving of the teaching strategies by monitoring the evaluation of the students progress through the semester
4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)
Not effective yet.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.
• The course will be evaluated periodically after each semester based on the results of the students and the report presented by the teaching stuff that will be discussed with the course coordinator so as to improve the course.

Faculty or Teaching Staff: **Jaber Al- Fahemi**

Signature: **Date Report Completed: 2016**

Received by: Dr. Ismail Althagafi **Head of the Department**

Signature: ________________________________ Date: _______________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specifications
(CS)

Surface chemistry

4023554-3

Course Specifications

Institution: **Umm Al-Qura University** Date of Report

College/Department /**Applied Science /Chemistry Department**

A. Course Identification and General Information

1. Course title and code: **Surface chemistry/ 4023554-3**
2. Credit hours: **3 (2 theoretical + 1 practical)**
3. Program(s) in which the course is offered. **Chemistry**
(If general elective available in many programs indicate this rather than list programs)
4. Name of faculty member responsible for the course: **Prof. Dr Abd El Rahman Khedr**
5. Level/year at which this course is offered:**6/3th**
6. Pre-requisites for this course (if any) **Colloids and phase rule**
7. Co-requisites for this course (if any)---------
8. Location if not on main campus: **both on El-Abedyah and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ☒ What percentage? 100 %

b. Blended (traditional and online) What percentage? 70% ☐

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other What percentage? 30% ☐

Comments:

B Objectives

1. What is the main purpose for this course? The objectives of this course are to enable students to get information about surface tension and its determination, and study the nature of solid surface. Also the student should know the adsorption of gas on solid surface. Also , at the end of this course the student should know the most recent surface characterization techniques
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) **The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course.**

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact Hours
Introduction in surface tension and its determination	1	2
▪ kelvin and young Laplace equations	1	2
Effect of temperature on surface tension and Parachor	1	2
▪ Single crystal surface, simple and complex surface structures and Millar indices ▪ Relaxed, reconstructed, faceted surfaces	3	6
Periodic Exam	1	2
▪ Bimetallic surfaces. ▪ Adsorption of gas on solid surfaces, and method of determination	2	4

▪ Frindlish, Langmuir and BET adsorption isotherms	2	4
▪ Some microscopic and spectroscopic tools of surface characterization such as: SEM, TEM, AFM, STM, XRD , XPS,…………	2	4
▪ Finial exam	1	2

Laboratory part:

Introduction to surface tension
Determination of the radius of the capillary tube using capillary rise method
Determination of the surface tension of different liquids using the capillary rise method.
Determination of the surface tension of water by the capillary rise method at different temperature
Determination of surface tension of liquids using capillary tubes of different diameters
Determination of surface adsorption of amyl alcohol from aqueous solutions
Adsorption of Acetic acid on activated charcoal **(Study the Effect of concentration on adsorption)**
Adsorption of oxalic acid on activated charcoal **(Study nature of adsorbate using Freundlich isotherm)**
Adsorption of Oxalic acid on activated charcoal **(Application of Langmuir isotherm)**
Heat of adsorption of acetic acid on activated charcoal

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28		42			70
Credit	2		1			3

3. Additional private study/learning hours expected for students per week. ☐

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	**Course Teaching Strategies**	**Course Assessment Methods**
1.0	**Knowledge**		
1.1	Recognize the surface tension and its determination	Lectures Lab.	Exams lab manuals

1.2	Write the equations of gas adsorption on the solid	Lectures Lab	Exams lab manuals
2.0	**Cognitive Skills**		
2.1	Compare between techniques used in surface	Lab, Lectures	Exams lab manuals
2.2	Apply the adsorption equations in the Lab.	Lab, Lectures	
3.0	**Interpersonal Skills & Responsibility**		
	• Ability to work in a team to perform a specific experimental tasks. • Ability to work independently to handle chemicals • Ability to communicate results of work to classmate and participation in class or laboratory discussions	• Class discussions • Research activities	• Performance on in-practical exams. • Work on research activity. • Overall student performance in Lab. discussions • Cross questions after finishing laboratory work
4.0	**Communication, Information Technology, Numerical**		
	• Evaluate the different methods of surface tension determination • Enhancing the ability of students to use computers and internet. • Interpret chemical data • Present chemical data orally. • Know how to write a report. • Demonstrate the methods used in adsorption .	Lab, Lectures	Exams lab manuals
5.0	**Psychomotor**		
5.1	Laboratory practice . including 1.Locate Materials Safety Data Sheets, chemicals carcinogens list, and hazardous chemicals list. 2. Handle chemicals safely with a proper PPE 3.Dilute solutions, repeat analysis and calculate true result for all procedures performed as required. 4.Dispose the hazardous solution in right way	Practical session should include both demonstration and experiments .	1.Repetition of the experiments , to reproduce the results 2.Written report of chart and procedures. 3.The students should be able to correlate their results with experimental conditions
5.2			

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment

1	Homework or activities.	--	10 %
2	Midterm Exam.	8	20 %
3	Practical Exam.	14	30 %
4	Final Exam.	16	40 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- Presence of faculty members to provide consulting and advice.
- Office hours: during the working hours weekly, and the creation of appropriate means.

E. Learning Resources

1. List Required Textbooks

1. **Surface Analysis: The Principal Techniques, 2nd Edition, John C. Vickerman, Ian Gilmore, Wiley, 2009.**
2. **Surface Chemistry, Elaine M. Mc Cash , 1st ed., Oxford University Press, 2001.**
3. Introduction to Applied Colloid and Surface Chemistry, Georgios M. Kontogeorgis & Soren Kiil, WILEY, 2016
4. Surface and Colloid Chemistry, Principles and Applications, K. S. Birdi, CRC Press, Taylor and Francis Group, 2010

2. List Essential References Materials (Journals, Reports, etc.)

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

1. **Surface Analysis: The Principal Techniques, 2nd Edition, John C. Vickerman, Ian Gilmore, Wiley, 2009.**
2. **Surface Chemistry, Elaine M. Mc Cash , 1st ed., Oxford University Press, 2001.**
3. Introduction to Applied Colloid and Surface Chemistry, Georgios M. Kontogeorgis & Soren Kiil, WILEY, 2016
4. Surface and Colloid Chemistry, Principles and Applications, K. S. Birdi, CRC Press,

Taylor and Francis Group, 2010

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

-http://en.wikipedia.phys/wiki/Petroleum1
-http://www.chemhelper.com/
- http://www.chemweb.com/

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

-Microsoft PowerPoint, Microsoft Word
-Videos on the chemistry of surfaces.
- Educational CD for surface Chemistry correlated with other themes

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)
-classroom capacity (30) students.

2. Computing resources (AV, data show, Smart Board, software, etc.)

Hall equipped with a computer and the Data Show and Television is urgently required

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)
No other requirements

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

Scheduled to complete the questionnaire calendar in particular.
- Focus group discussions with small groups of students.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor
Feedback and assistance from colleagues.
- Independent evaluation of the extent to which students of the standards.
- independent advice to the duties and tasks

3 Processes for Improvement of Teaching

Workshops for the teaching methods.
- Continuous training for the faculty member.
- Revision of the proposed strategies.
- The provision of modern tools necessary for learning.
- Application of the means of e-learning.
- Exchange of internal and external experiences

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

Checking the samples of test papers, or student work, which has been corrected by a faculty member.
- Exchange professors from different educational institutions on regular basis to correct samples of test papers

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

Consult with other professors teaches the same subject.
- Hosting a visiting professor to evaluate the subject.
- Workshops for teachers whom teach the same subject.
- Periodic review for teachers to modify the negatives contents in the subject.

Faculty or Teaching Staff: Dr Abd El Rahman Khedr

Signature: ________________________________ Date Report Completed: ____________________

Received by: Dr. Ismail Althagafi Dean/Department Head

Signature: ________________________________ Date: _______________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Electrochemistry

4022143-3

Course Specifications

Institution **Umm Al-Qura University** Date of Report

College/Department **Applied Science /Chemistry Department**

A. Course Identification and General Information

1. Course title and code: **Electrochemistry / 4022143-3**

2. Credit hours **3 (2 theoretical +practical)**

3. Program(s) in which the course is offered.
(If general elective available in many programs indicate this rather than list programs)
Chemistry

4. Name of faculty member responsible for the course
Professor Alaa El-Shafei

5. Level/year at which this course is offered
4th level/second year

6. Pre-requisites for this course (if any)
Chemical Kinetics-Thermodynamics

7. Co-requisites for this course (if any)

8. Location if not on main campus: **both on El-Abedyah and El-Zaher**

9. Mode of Instruction (mark all that apply)

a. Traditional classroom	■	What percentage?	100 %
b. Blended (traditional and online)	☐	What percentage?	
c. e-learning		What percentage?	
d. Correspondence	☐	What percentage?	
f. Other		What percentage?	

Comments:

B Objectives

What is the main purpose for this course? • **List types of electrodes and types of electrochemical cells.** • **Types of standard electrodes and compare them.** • **Write Nernst equation and solve related problems.** • **List Faraday's laws and solve relevant problems.** • **Compare forms of corrosion** • **List types of fuel cells**
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) • **Using information technology and the Internet to prepare detailed research of everything new in the course.** • **Number of lecture contact hours will be increased to 4 to allow a chance to introduce new subjects as electrode kinetics and cyclic voltammetry.** • **Add lectures to review all new applications in the area of specialization through use of explanatory films and presentations (Video Projector), (power point)** • **Workshops and scientific forums regularly for more information and training.**

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact Hours
- **Introduction to electrochemistry-Types of electrochemical series** - **Standard redox potentials**	**2**	**4**
- **Cell potential**	**1**	**2**
- **Electrode potential and Nernst equation.**	**1**	**2**
- **Electrochemical series**	**1**	**2**
- **First exam**	**1**	**2**
- **Standard electrode potentials- Hydrogen and oxygen electrodes**	**1**	**2**
- **Concentration cells**	**1**	**2**

- Applications on cell potential	2	4
- Second exam	1	2
- Batteries and Fuel cells	1	2
- Forms of corrosion	2	4
- Corrosion Inhibition	1	2
- Final exam	1	2

Laboratory Part

Experiment	No. of weeks	Contact hours
Daniell Cell	1	3
Concentration cells	1	3
Electrodeposition at electrodes	1	3
Measurements of cell potential	1	3
Determination of solubility of sparingly soluble salt	1	3
Electroplating	1	3
Measurements of some electrochemical parameters from Tafel Plots	1	3
Determination of the corrosion inhibition efficiency of some inhibitors using Tafel plots	1	3
Determination of corrosion rates using weight loss method	1	3
Determination of the corrosion inhibition efficiency of some inhibitors using weight loss method	1	3
Determination of corrosion rates using thermometric method	1	3
Determination of the corrosion inhibition efficiency of some inhibitors using thermometric method	1	3
Revision	1	3
Final exam	1	3

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	**28**		42			70
Credit	2		1			3

3. Additional private study/learning hours expected for students per week. : 2hr

-

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

- **A brief summary of the knowledge or skill the course is intended to develop;**
- **A description of the teaching strategies to be used in the course to develop that knowledge or skill;**
- **The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.**

	NQF Learning Domains And Course Learning Outcomes	**Course Teaching Strategies**	**Course Assessment Methods**
1.0	**Knowledge**		
1.1	**To know terminology of electrochemistry**	• **Lectures** • **Scientific discussion** • **Library visits** • **Web-based study**	• **Exams** • **web-based student performance systems** • **portfolios** • **long and short essays posters lab manuals**
1.2	**Write Nernst equation for determination of cell potential**		
1.3	**List the applications of galvanic cells**		
1.4	**List types of electrodes**		
1.5	**To write about forms of corrosion**		
1.6	**To mention types of fuel cells**		
2.0	**Cognitive Skills**		
2.1	**Compare types of electrochemical cells and the**	• **Lectures** • **Scientific discussion**	• **web-based student performance systems**

	reaction at the half cells	• **Library visits** • **Web-based study**	• **portfolios** • **posters** **demonstrations**
2.2	**Solve Problems on Nernst equation**		
2.3	**Solve problems on Faraday's laws**		
2.4	**Apply Faraday's laws for calculating the amount deposited at electrodes**		
2.5	**Predict an assembly of galvanic cell**		
2.6	**Compare types of fuel cells**		
2.7	**Compare methods of inhibition of corrosion**		
3.0	**Interpersonal Skills & Responsibility**		
	• Ability to work in a team to perform a specific experimental tasks. • Ability to work independently to handle chemicals • Ability to communicate results of work to classmate and participation in class or laboratory discussions	• Class discussions • Research activities	• Performance on in-practical exams. • Work on research activity. • Overall student performance in Lab. discussions • Cross questions after finishing laboratory work
4.0	**Communication, Information Technology, Numerical**		
4.1	- **The ability to debate and dialogue with clear scientific method.**	- Lectures - Scientific discussion - Library visits - Web-based study	- web-based student performance systems - individual and group presentations
4.2	**The ability to present or explain scientific topic.**		
5.0	**Psychomotor**		
	Laboratory practice . including 1.Locate Materials Safety Data Sheets, chemicals carcinogens list, and hazardous chemicals list. 2. Handle chemicals safely with a proper PPE 3.Dilute solutions, repeat analysis and calculate true result for all procedures performed as required. 4.Pipette accurately at all times 5.Dispose the hazardous solution in right way	Practical session should include both demonstration and experiments .	1.Repetition of the experiments , to reproduce the results 2.Written report of chart and procedures. 3.The students should be able to correlate their results with experimental conditions

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment

1	Homework or activities.	--	10 %
2	Midterm Exam.	8	20 %
3	Practical Exam.	14	30 %
4	Final Exam.	16	40 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

Electrochemistry Principles, Methods and Applications, Christopher M. A. Brett, Maria Oliveira Brett, Oxford University Press, 2005.

2. List Essential References Materials (Journals, Reports, etc.)

1. **A.J. Bard ,L.R. Faulkner, Electrochemical Methods , Fundemental and Applications,2010 John Wiley & Sons**
2. **Handbook of Electrochemistry, Cynthia Zosk, Elsevier, 2011.**
3. **Handbook of Corrosion Engineering (Chinese), Pierre R. Roberge, McGraw-Hill, 2005.**
4. **Corrosion Basics: An Introduction, Pierre R. Roberge, NACE International, 2006.**

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com** - **http://www.sciencedirect.com**
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) - **Classrooms capacity (30) students.** - **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

- **Room equipped with computer and projector.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching
Complete the questionnaire evaluation of the course in particular.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- **Observations and the assistance of colleagues.**
- **Independent evaluation for extent to achieve students the standards.**
- **Iindependent advice of the duties and tasks.**

3 Processes for Improvement of Teaching

- **Workshops for teaching methods.**
- **Continuous training of member staff.**
- **Review of strategies proposed.**
- **Providing new tools for learning.**
- **The application of e-learning.**
- **Eexchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: Professor Alaa El-Shafei

Signature: _________________________________ Date Report Completed: _____________________

Received by: _ Dr. Ismail Althagafi Department Head

Signature: _________________________________ Date: ________________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specifications
(CS)

Industrial Application of Catalysis

4024777-3

Course Specifications

Institution **Umm Al-Qura University** Date of Report

College/Department **Applied Science /Chemistry Department**

A. Course Identification and General Information

1. Course title and code: **Industrial Application of Catalysis 4024777-3**
2. Credit hours: 2
3. Program(s) in which the course is offered**. Industrial chemistry**
(If general elective available in many programs indicate this rather than list programs)
4. Name of faculty member responsible for the course: **Dr Abd El Rahman Khedr**
5. Level/year at which this course is offered:7/4
6. Pre-requisites for this course (if any) **Surface chemistry**
7. Co-requisites for this course (if any)………….
8. Location if not on main campus: **El-Abdyah**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ■ What percentage? 100%

b. Blended (traditional and online) What percentage? ☐

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other What percentage? ☐

Comments:

B Objectives

1. What is the main purpose for this course? The basic objectives of this course are to study the catalysts preparation methods and homogeneous and heterogeneous catalysis, the role of catalysts in industrial processes, and how to select the appropriate catalysts for each industrial application. Also study the most suitable process conditions of pressure and temperature at which the catalytic efficiency is maximum
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) **The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course.**

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact Hours
Introduction (The phenomenon catalysis, mode of action of catalysts, activity, turnover Frequency TOF, turnover number TON [T 46], selectivity, stability, classification of catalysts and comparison of homogeneous and heterogeneous catalysis).	2	4
Economic importance of catalysts. Methods of catalyst preparation	3	6
exam	1	2
Homogeneously catalyzed industrial processes (overview, production of acetic acid by carbonylation of methanol, selective ethylene oxidation by the Wacker Process, oxidation of cyclohexane, Suzuki coupling).	3	6

Heterogeneously catalyzed processes in industry (overview, production of inorganic chemicals, production of organic chemicals, refinery processes, catalyst cracking processes, ammonia synthesis, hydrogenation, methanol synthesis, selective oxidation of propene olefin polymerization, fine chemicals manufacture, acid/base catalysis)	3	6
• Catalysis reactors.	2	4
Final exam		

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28		42			70
Credit	2		1			3

3. Additional private study/learning hours expected for students per week. 4hr

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	**Course Teaching Strategies**	**Course Assessment Methods**
1.0	**Knowledge**		
1.1	Recognize the types of catalysis	• Lectures • Scientific discussion	Exams web-based student performance systems
1.2	Write the methods of catalyst preparation		
1.3	Define the catalyst activity, selectivity, TOF, TON….		
2.0	**Cognitive Skills**		
2.1	Compare between homogeneous and heterogeneous catalysis	• Lectures • Scientific discussion	Exams web-based student performance systems
2.2	Compare different methods of catalyst preparation		
2.3	Compare between catalytic reactors		
3.0	**Interpersonal Skills & Responsibility**		

3.1	• Ability to work in a team to perform a specific experimental tasks. • Ability to work independently to handle chemicals • Ability to communicate results of work to classmate and participation in class or laboratory discussions	• Class discussions • Research activities	• Performance on in-practical exams. • Work on research activity. • Overall student performance in Lab. discussions • Cross questions after finishing laboratory work
3.2			
4.0	**Communication, Information Technology, Numerical**		
4.1	Calculate the reaction yields and product selectivity	Lab, Lectures	web-based student performance systems individual and group presentations
4.2	Select suitable reactor for certain reaction		
5.0	**Psychomotor**		
5.1	Laboratory practice . including 1.Locate Materials Safety Data Sheets, chemicals carcinogens list, and hazardous chemicals list. 2. Handle chemicals safely with a proper PPE 3. repeat analysis and calculate true result for all procedures performed as required. 4.Dispose the hazardous solution in right way	Practical session should include both demonstration and experiments .	1.Repetition of the experiments , to reproduce the results 2.Written report of chart and procedures. 3.The students should be able to correlate their results with experimental conditions
5.2			

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	Midterm Exam.	8	20 %
3	Practical Exam.	14	30 %
4	Final Exam.(2hours exam)	16	40 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- Presence of faculty members to provide consulting and advice. **- Office hours: during the working hours weekly, and the creation of appropriate means.**

E. Learning Resources

1. List Required Textbooks • Catalysis Concepts and Green Applications, Gadi Rothenberg , John Wiley & Sons, **2008**. • Industrial Catalysis: A Practical Approach, Second Edition. Jens Hagen WILEY VCH Verlag GmbH & Co. KGaA, Weinheim, **2006**, ISBN: 3-527-31144-0. • Catalytic chemistry , Bruce C. Gates, John Wiley & Sons **1992**, New York • Catalysis from A to Z A Concise Encyclopedia 2nd ed B. Cornils, W. A. Herrmann, R. Schlögl, C.-H. Wong, **2003**. • Industrial Catalysis: A Practical Approach, Jens Hagen, Wiley-VCH Verlag GmbH & Co. KGaA, **2015**
2. List Essential References Materials (Journals, Reports, etc.)
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc) • Catalysis Concepts and Green Applications, Gadi Rothenberg , John Wiley & Sons, **2008**. • Industrial Catalysis: A Practical Approach, Second Edition. Jens Hagen WILEY VCH Verlag GmbH & Co. KGaA, Weinheim, **2006**, ISBN: 3-527-31144-0. • Catalytic chemistry , Bruce C. Gates, John Wiley & Sons **1992**, New York • Catalysis from A to Z A Concise Encyclopedia 2nd ed B. Cornils, W. A. Herrmann, R. Schlögl, C.-H. Wong, **2003**. • Industrial Catalysis: A Practical Approach, Jens Hagen, Wiley-VCH Verlag GmbH & Co. KGaA, **2015**
4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.) **http://en.wikipedia.phys/wiki/Petroleum1** **-http://www.chemhelper.com/** **- http://www.chemweb.com**
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software. **Microsoft PowerPoint, Microsoft Word** **-Videos on the chemistry of surfaces.** **- Educational CD for surface Chemistry correlated with other themes**

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) **-classroom capacity (30) students.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

Hall equipped with a computer and the Data Show and Television is urgently required

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

No other requirements

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

Scheduled to complete the questionnaire calendar in particular.
- Focus group discussions with small groups of students.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor
Feedback and assistance from colleagues.
- Independent evaluation of the extent to which students of the standards.
- independent advice to the duties and tasks

3 Processes for Improvement of Teaching

Workshops for the teaching methods.
- Continuous training for the faculty member.
- Revision of the proposed strategies.
- The provision of modern tools necessary for learning.
- Application of the means of e-learning.
- Exchange of internal and external experiences

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

Checking the samples of test papers, or student work, which has been corrected by a faculty member.

- Exchange professors from different educational institutions on regular basis to correct samples of test papers

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

Consult with other professors teaches the same subject.
- Hosting a visiting professor to evaluate the subject.
- Workshops for teachers whom teach the same subject.
- Periodic review for teachers to modify the negatives contents in the subject.

Faculty or Teaching Staff: Dr Abd El Rahman Khedr
Signature: _________________________________ Date Report Completed: ____________________

Received by: Dr. Ismail Althagafi Department Head

Signature: _________________________________ Date: _______________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Colloid Chemistry and Phase Rule

4022146-1

Course Specifications
(CS)

Course Specifications

Institution **Umm Al-Qura University**	Date of Report **2015**
College/Department **Faculty of Applied Science/ Department of Chemistry**	

A. Course Identification and General Information

1. Course title and code: **Colloid Chemistry and Phase Rule- 4022146-1**
2. Credit hours: **1hrtheoretical)**
3. Program(s) in which the course is offered. **Chemistry**
4. Name of faculty member responsible for the course: **Dr. Ahmed Fawzy Saad**
5. Level/year at which this course is offered: **5th level/third Year**
6. Pre-requisites for this course (if any) **General Chemistry (2)**
7. Co-requisites for this course (if any): **none**
8. Location if not on main campus: **both on El-Abedyah and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom	☐	What percentage?	☐
b. Blended (traditional and online)	■	What percentage?	**100%**
c. e-learning	☐	What percentage?	☐
d. Correspondence	☐	What percentage?	☐
f. Other	☐	What percentage?	☐

Comments:

B Objectives

1. What is the main purpose for this course?

By the end of the study of this course have students familiar with

- **the basic concepts of colloid chemistry**
- **types of colloids and there preparation methods**
- **properties of colloids and their applications**
- **basics of phase rule and its important**
- **examples of phase rule to mono, di and tri component systems**

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

Use smart teaching halls for lectures.

*** Encourage students to link colloid chemistry course and what studied numerous applications in various domains such as Chemistry and medicine and Pharmacy and the food industry, water purification and industry and succession through work reports both from the library or using the Internet (self-teaching) and through discussion with Standing**

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
1-Definition of colloids with examples	**1**	**2**
2- Classification of colloids	**1**	**2**
3- Theory of colloid stabilization	**1**	**2**
4- Methods of colloids preparations	**1**	**2**
5- Colloid technology **6- Colloid properties**	**1**	**2**
7- Importance of colloids and its importance	**1**	**2**
8- Definition of phase rule	**1**	**2**
9- Physical changes dynamics	**1**	**2**
10- Cielus Calpyron Equation	**1**	**2**
11- Studying phase rule low	**1**	**2**
12- Phase rule of one component system	**1**	**2**
13- Phase rule of two component system	**1**	**2**

14- Phase rule of three component system	**1**	**2**
15- General Revision and Exam	**1**	**2**

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	**28**	**-**	**-**	**-**		**28**
Credit	**2**	**-**	**-**	**-**		**2**

3. Additional private study/learning hours expected for students per week. **1 hour/week**

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Mention the main differences between colloids and suspension and true solution.	1.Lectures using white board and data show 2. Problem classes 3. discussion groups	1.Midterm exam 2.quizzes 3.Group discussion 4.Final exam
1.2	List the preparation and purifying of colloidal solutions.		
1.3	Describe characteristics of colloidal solutions.		
1.4	Describe the most important applications of colloidal solutions.		
1.5	Describe the phase rule and its classifications.		
1.6	Mention equilibrium curves for different systems.		
2.0	**Cognitive Skills**		
2.1	Compare between colloids and suspension and true solution.	• Scientific discussion • Library visits	• web-based student performance
2.2	Give concise about the characteristics of colloidal		

	solutions	• Web-based study	systems • portfolios • posters • demonstrations
2.3	Analyze the relations between different phases of material.		
2.4	Apply equilibrium curves for different systems		
3.0	**Interpersonal Skills & Responsibility**		
3.1	Manage resources, time and collaborate with members of the group.	1. Team work groups for cooperative work making. 2. Presenting the analysis and interpretation of a case study for each group to the other groups in class. 3.Open a general discussion with students in the area of educational issues for knowledge transfer between the students.	1.Writing group scientific report for a case study. 2.Assessment of the solution of problems submitted by the students.
	Use university library and web search engines for collecting information and search about different topics .		
4.0	**Communication, Information Technology, Numerical**		
4.1	Work effectively both in a team, and independently on solving chemistry problems.	1.Write a Report 2.Use digital libraries and/or E-Learning Systems for the communication with lecturer through the course work	1.Evaluating the activities of the students through the semester for their activities on the E-learning system, as well as, their communication with each other in different tasks. 2.Evaluation of the report presented
4.2	Communicate effectively with his lecturer and colleagues		
4.3	Use IT and web search engines for collecting information.		
5.0	**Psychomotor**		
5.1	NOT APPLICABLE		

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	First Periodic Exam.	6	20 %

3	Second Periodic Exam.	12	20 %
4	Final Exam.	16	50 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

* **Handbook of Applied Surface and Colloid Chemistry, Vol. 1-2, Holmberg, Krister, John Wiley & Sons, New York, 2002.**

* **PHYSICAL CHEMISTRY IN BRIEF, Josef P. Novak, Stanislav Labık, Ivona Malijevska, Institute of Chemical Technology, Prague, 2005.**

2. List Essential References Materials (Journals, Reports, etc.)

* **Lecture Hand outs available on the coordinator website .**

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

* **Emulsions, Foams, and Suspensions: Fundamentals and Applications, Laurier L. Schramm, WILEY-VCH Verlag GmbH & Co, 2005.**

* **Colloidal Chemistry, A. Goel, Discovery Publishing House, 1st ed., New Delhi, 2006.**

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com**
- **http://www.sciencedirect.com**
- **http://www.rsc.org**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- **Classrooms capacity (30) students.**
- **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

- **Room equipped with computer and projector and TV.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

Complete the questionnaire evaluation of the course in particular.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- **Observations and the assistance of colleagues.**
- **Independent evaluation for extent to achieve students the standards.**
- **Independent advice of the duties and tasks.**

3 Processes for Improvement of Teaching

- **Workshops for teaching methods.**
- **Continuous training of member staff.**
- **Review of strategies proposed.**
- **Providing new tools for learning.**
- **Application of e-learning.**
- **Eexchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: Dr. Ahmed Fawzy Saad

Signature: **Date Report Completed: 2015**

Received by: Dr. Ismail Althagafi **Department Head**

Signature: ________________________________ Date: _______________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specifications
(CS)

Corrosion and Electroplating

4024778-2

Course Specifications

Institution: **Umm Al-qura University** Date of Report: **2016**

College/Department : **Faculty of Applied Science/ department of chemistry**

A. Course Identification and General Information

1. Course title and code: **Corrosion and Electroplating 4024778-2**
2. Credit hours: **2 (theoretical)**
3. Program(s) in which the course is offered**. Ind Chemistry program**
4. Name of faculty member responsible for the course: **Professor MetwallyAbdallah**
5. Level/year at which this course is offered: **4rd level/1st year**
6. Pre-requisites for this course (if any): **-**
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **El-Abdyah**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ☒ What percentage? **100%**

b**. Blended (traditional and online)** ☐ What percentage? ☐

c. e-learning What percentage?

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage? ☐

Comments:

B Objectives

1. What is the main purpose for this course? **1- Recognize the fundamental principles of corrosion and electroplating.** **2. Know the fundamental of different types of corrosion and corrosion inhibitors.** **3. Develop the passivity of metals** **4-Describe the factors affecting on the corrosion of metals and alloys in aqueous solutions** **5- Select the suitable inhibitors to overcome the corrosion .**
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) **1-The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course** 2- encourage students to make reports in the recent trends in the field of solutions chemistry, either from the library or by using the Internet.

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact Hours
Introduction on the corrosion science and electrode potential	1	2
Thermodynamic of corrosion	1	2
Different types of corrosion	1	2
Pitting corrosion ,theories and its measurements	1	2

Passivity, Theories of passivity	1	2
Measurements of corrosion rate by chemical and electrochemical measurements	1	2
Corrosion inhibitors,	1	2
Mid term	1	2
Introduction o n the principle and the aim of electroplating	1	2
Factors affecting on the electroplating process	1	2
Effect of organic and inorganic additives on the electroplating process	1	2
Preparation of electroplating paths e.g.,copper,zinc .nickel,..	1	2
Mechanism of electroplating	1	2
General review	1	2

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28					28
Credit	2					2

3. Additional private study/learning hours expected for students per week. 2hr

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	• List the historical development (thinking back) and to acquire student skill training to choose appropriate methods of and gas liquefaction.	• Lectures • Scientific	• Exams • web-based

1.2	• **describe the student predicating skill of equivalent conductance at infinite dilution for week electrolyte.**	discussion • Library visits • Web-based study	student performance systems • portfolios • long and short essays • posters lab manuals
1.3	• Illustrate **the values of transport numbers , ionic strength and distribution of molecular velocities.**		
1.4	• **mentionappropriate methods of determination of ionization constant of week electrolyte.**		
1.5	• **Define different ways to determine Vant Hoff factor**		
1.6	• **Explain different ideas for student innovates the studying the deviation of gases**		
1.7	**Describe the student plans of research program in the field of solution chemistry according to organized steps.**		
2.0	**Cognitive Skills**		
2.1	• **Generate dialogue and debate within the classroom.**	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • posters • demonstrations
2.2	• **Examples given in the lecture and exercise under the supervision of teaching workshops.**		
2.3	• **Give some practical issues and assigning students to create a strategic plan for the solution.**		
2.4	• **Encourage the transmission of learning using analysis tools in various applications and through discussion of potential applications in other areas.**		

2.5	**Commissioned student functions duties include open tasks designed to apply the predicating skills, analysis and problem solving.**		
3.0	**Interpersonal Skills & Responsibility**		
3.1	• **Work in teams to conduct some joint reports.**	• Scientific discussion • Web-based study	• web-based student performance systems
3.2	•		
4.0	**Communication, Information Technology, Numerical**		
4.1	• **Use the computer in the compilation of research that helps in writing reports on topics relevant to the course.**	• Lectures • Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
4.2	• **Use the computer and the Internet to identify sources of recent research relevant to the course**		
5.0	**Psychomotor**		
5.1	NOT APPLICABLE		
5.2			

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	First Periodic Exam.	6	20 %
3	Second Periodic Exam.	12	20 %
4	Final Exam.(2hours exam)	16	50 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

1-E.E. Stansbury and R.A. Buchanan
"***Fundamentals of electrochemical corrosion***" ASM International (2000)

2-Nasser Kanani.,Electroplating : basic principles, processes and practice, Elsevier, 2004

3- V. S. SASTRI, EDWARD GHALI, MIMOUN ELBOUJDAINI
'*Corrosion Prevention and Protection*', Practical Solutions, John Wiley & Sons Ltd, The Atrium, Southern Gate, Chichester,

4.Introduction to Corrosion Science, E. McCafferty, Springer, 2010

5-Milan Paunovic and Mordechay Schlesinger."***Fundamentals of electrochemical deposition***" A Johm Wiley & Sons, Inc., 2nd ed. (2006)

2. List Essential References Materials (Journal s, Reports, etc.)

- Lecture Hand outs available on the coordinator website

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

-Nestor Pere ,"***Electrochemistry and Corrosion Science***" Kluwer Academic Publisher(2004)

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://en.wikipedia.org/wiki/Petroleum1- http://www.chemhelper.com/**
- **http://www.chemweb.com/**
- **http://www.science.uwaterloo.ca/~cchieh/cact/**
- **http://www.sciencedirect.com/**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- **Classrooms capacity (30) students.**
- **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

- **Room equipped with computer and projector and TV.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

Complete the questionnaire evaluation of the course in particular.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- **Observations and the assistance of colleagues.**
- **Independent evaluation for extent to achieve students the standards.**
- **Iindependent advice of the duties and tasks.**

3 Processes for Improvement of Teaching

- **Workshops for teaching methods.**
- **Continuous training of member staff.**
- **Review of strategies proposed.**
- **Providing new tools for learning.**
- **The application of e-learning.**
- **Eexchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**

- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: **Professor Metwally Abdallah**

Signature: **Date Report Completed 2016**

Received by: Dr. Ismail Althagafi **Department Head**

Signature: ________________________________ **Date:** _______________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specifications
(CS)

Nanochemistry

4024584-2

Course Specifications

Institution Date of Report
Umm Al-Qura University

College/Department /**Applied Science /Chemistry Department**

A. Course Identification and General Information

1. Course title and code: **Nanochemistry / 4024584-2**
2. Credit hours: 2 (theoretical)
3. Program(s) in which the course is offered. chemistry
(If general elective available in many programs indicate this rather than list programs)
4. Name of faculty member responsible for the course: **Prof. Dr Abd El Rahman Khedr**
5. Level/year at which this course is offered: 8/4th
6. Pre-requisites for this course (if any) surface chemistry
7. Co-requisites for this course (if any)
8. Location if not on main campus: **both on El-Abedyah and El-Zaher**
9. Mode of instruction (mark all that apply)

a. Traditional classroom ■ What percentage? 100%

b. Blended (traditional and online) What percentage? ☐

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage? ☐

Comments:

B Objectives

1. What is the main purpose for this course? Make the students acquainted to the basic concept of nanochemistry and changes of chemical and physical properties due size reduction, and the terminology related to science, nanomaterials and nanotechnology. The students will study the methods of nanoparticle preparation, the most recent tools of nanomaterials characterization, the applications and fictionalization of nanomaterials.
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) **The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course.**

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
General introduction and history of nanotechnology. Importance of the nanoparticles in industries and in our lives.	3	6
Approaches in nanotechnology and typical syntheses of nanoparticles. Properties of nanomaterials, chemical and physical property. Reasons for changing the properties.	2	4
Classification of nanostructured and the chemical and physical properties of different nanostructured. Carbon Based Nanomaterials (Fullerenes, carbon-nanotubes and graphene)	3	6
exam	1	2
▪ Nanomaterial based catalysts (inorganic nano materials, metal oxide supports, supported nano metal catalysts). ▪ Methods of preparation of nano-formulations and mesoporous materials	2	4

▪ Nanoparticle synthesis and fixtures nanoparticles and **nanocolloids**: Basic synthesis and fabrication methods for nanomaterials (CVD, impregnation, sol-gel, microemulsion, template, hydrothermal) titanium nanotubes with and without palladium, silver and gold nanoparticles and some other fixtures ▪ Spectroscopic and microscopic tools used in nanomaterials characterizations	2	4
▪ General industrial applications for nanoscale systems and fixtures, nano-optic applications, bio-nanotechnology applications and medical nanotechnology applications ▪ Nanotechnology and clean technologies: What is a clean technology challenges facing us in the areas of energy, water and environment, exploring the contribution of nanotechnology to solve these problems, the current obstacles faced by nanotechnology.	2	4
Final exam	1	2

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28					28
Credit	2					2

3. Additional private study/learning hours expected for students per week.2hr

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Recognize the methods of nanoparticles preparation	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems
1.2	Name the some applications of nanomaterials in industry		

2.0	**Cognitive Skills**		
2.1	Compare between properties of nanomaterials	• Scientific discussion • Library visits • Web-based study	• web-based student performance systems exams
2.2	Compare between methods of characterization of nanomaterials		
3.0	**Interpersonal Skills & Responsibility**		
	• Ability to communicate results of work to classmates. • Ability to work in a team to perform a specific task.	• Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
4.0	**Communication, Information Technology, Numerical**		
	• Interpret the results of characterization tools • Encourage students to use internet for searching certain electronic journals regarding topics of the course. • Scientific writing.	• Scientific discussion • Library visits	• web-based student performance systems • individual and group presentations
5.0	**Psychomotor**		
5.1	NOT APPLICABLE		
5.2			

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	First Periodic Exam.	6	20 %
3	Second Periodic Exam.	12	20 %
4	Final Exam.	16	50 %

5	**Total**	**100 %**

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- Presence of faculty members to provide consulting and advice.
- Office hours: during the working hours weekly, and the creation of appropriate means.

E. Learning Resources

1. List Required Textbooks

1. Nanochemistry. G.B. Sergeev, K.J. Klabunde, Elsevier, **2013**, ISBN: 978-0-444-59397-9
2. Introduction to Nanoscience and Nanotechnology, Gabor L. Hornyak, H.F. Tibbals, Joydeep Dutta, John J. Moore, CRC Press. Copyright, **2009**.
3. Nanomaterials and Nanochemistry, C. Bréchignac, P. Houdy, M. Lahmani, Springer Science & Business Media. Copyright, **2006**.
4. "Nanochemistry, A Chemical Approach to Nanomaterials", G. Ozin and A. Arsenault, RSC (Royal Society of Chemistry), **2005**.
5. "Nanostructures and Nanomaterials", G. Cao, Imperial College Press, **2004**
6. Nanotechnology: Nanomaterials and Nanodevices, G. Mohan Kumar, Alpha Science International Ltd. **2015**

2. List Essential References Materials (Journals, Reports, etc.)

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

1. Nanochemistry. G.B. Sergeev, K.J. Klabunde, Elsevier, **2013**, ISBN: 978-0-444-59397-9
2. Introduction to Nanoscience and Nanotechnology, Gabor L. Hornyak, H.F. Tibbals, Joydeep Dutta, John J. Moore, CRC Press. Copyright, **2009**.
3. Nanomaterials and Nanochemistry, C. Bréchignac, P. Houdy, M. Lahmani, Springer Science & Business Media. Copyright, **2006**.
4. "Nanochemistry, A Chemical Approach to Nanomaterials", G. Ozin and A. Arsenault, RSC (Royal Society of Chemistry), **2005**.
5. "Nanostructures and Nanomaterials", G. Cao, Imperial College Press, **2004**
6. Nanotechnology: Nanomaterials and Nanodevices, G. Mohan Kumar, Alpha Science International Ltd. **2015**

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

-http://en.wikipedia.phys/wiki/Petroleum1
-http://www.chemhelper.com/
- http://www.chemweb.com/

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software. **Microsoft PowerPoint, Microsoft Word** **-Videos on the chemistry of surfaces.** **- Educational CD for surface Chemistry correlated with other themes**

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) **-classroom capacity (30) students.**

2. Computing resources (AV, data show, Smart Board, software, etc.)
Hall equipped with a computer and the Data Show and Television is urgently required

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

No other requirements

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

Scheduled to complete the questionnaire calendar in particular.
- Focus group discussions with small groups of students.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor
Feedback and assistance from colleagues.
- Independent evaluation of the extent to which students of the standards.
- independent advice to the duties and tasks

3 Processes for Improvement of Teaching
Workshops for the teaching methods.
- Continuous training for the faculty member.
- Revision of the proposed strategies.
- The provision of modern tools necessary for learning.
- Application of the means of e-learning.
- Exchange of internal and external experiences

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)
Checking the samples of test papers, or student work, which has been corrected by a faculty member.
- Exchange professors from different educational institutions on regular basis to correct samples of test papers

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

Consult with other professors teaches the same subject.

- Hosting a visiting professor to evaluate the subject.

- Workshops for teachers whom teach the same subject.

- Periodic review for teachers to modify the negatives contents in the subject.

Faculty or Teaching Staff: Prof. Dr Abd El Rahman Khedr

Signature: ________________________________ Date Report Completed: ____________________

Received by: Dr. Ismail Althagafi /Department Head

Signature: ________________________________ Date: _______________

B- Organic Chemistry Courses

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Chemistry of Aliphatic Compounds

4022132-3

Course Specifications
(CS)

Course Specifications

Institution: **Umm Al-qura University** Date of Report: **2015**

College/Department : **Faculty of Applied Science/ department of chemistry**

A. Course Identification and General Information

1. Course title and code: **Chemistry of Aliphatic Compounds/ 4022132-3**
2. Credit hours: **3 hrs (2 theoretical + 1 practical)**
3. Program(s) in which the course is offered. **Chemistry program**
4. Name of faculty member responsible for the course: **Professor Mohamed Rabie**
5. Level/year at which this course is offered: **2rd level/1st year**
6. Pre-requisites for this course (if any): **General Chemistry 1**
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **both on El-Abdyah and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ☒ What percentage? **100%**

b**. Blended (traditional and online)** What percentage?

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage? ☐

Comments:

B Objectives

1. What is the main purpose for this course? **By the end of this course student will be familiar with nomenclature, chemical properties and synthesis of aliphatic compounds**
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) **The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course**

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Nomenclature of Hydrocarbons	1	2
Alkanes (Preparation, physical properties, chemical reactions cycloalkanes, conformations in cycloalkanes)	1	2
Alkenes (Preparation, physical properties, chemical reactions conjugated dienes, free radical addition, Diels alder reaction, and 1,4 cycloadditions in dienes	2	4
Alkynes (Preparation, Acidity of terminal alkynes, chemical reactions, induserial uses of alkynes)	1	2
Alkyl halides and dihalides (nomenclature, preparations and reactions)	1	2
Alcohols anddihydric and trihydric alcohols (nomenclature, chemical properties) and thioalcohols	1	2
Ethers (nomenclature, preparations and chemical properties) and thioethers	1	2
Organometallic compounds and Grignard reagents	1	2
Carbonyl compounds (nomenclature, preparation and chemical properties	2	4
Carboxylic acids and their derivatives (nomenclature, preparation and chemical properties)	1	2
Amines(nomenclature, preparation and chemical properties)	1	2
Inductive effect, resonance effect and stereochemistry	1	2

Laboratory Part:

I-Identification and investigation tests of the following

a. Alcohols

b. Aldehydes and ketones
c. Carboxylic acids
d. Salts of carboxylic acids

II-General scheme for identification of organic aliphatic unknown

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	-	42			70
Credit	2	-	1			3

3. Additional private study/learning hours expected for students per week. 4hr

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	**Course Teaching Strategies**	**Course Assessment Methods**
1.0	**Knowledge**		
1.1	Recognize the general IUPAC rules for nomenclature of different organic classes	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • long and short essays • posters lab manuals
1.2	Name different organic classes and organomettalic compounds using common and IUPAC system		
1.3	Know the classifications in different organic families		
1.4	Describe the different methods of preparations of organic compounds		
1.5	Familiar with the physical properties of different organic molecules and their relation with the structure		
1.6	Select the proper method of preparation of an organic molecule		
1.7	Identify the different conformations of alkanes and cycloalkanes		
1.8	Write a mechanism for a chemical organic transformation		
1.9	Determine the type of mechanism and intermediates in different organic reactions		
1.10	Recognize the industrial use of most famous organic molecules		
1.11	Memorize different name reactions in organic chemistry		
1.12	Outline the different uses of organometallic		

	compounds		
1.13	Define inductive and resonance effect		
2.0	**Cognitive Skills**		
2.1	Apply the IUPAC rules for all organic families	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • posters • demonstrations
2.2	Compare between IUPAC nomenclature and common nomenclature for organic compounds		
2.3	Explain the different strategies for preparation of organic compounds		
2.4	Analyze the reasons for the unique physical properties in some organic compounds		
2.5	Predict the most stable conformation of alkanes and cycloalkanes		
2.6	Summarize the different reactions of organic compounds		
2.7	Account for the acidity and basicity of different organic compounds		
3.0	**Interpersonal Skills & Responsibility**		
• Ability to work in a team to perform a specific experimental tasks. • Ability to work independently to handle chemicals • Ability to communicate results of work to classmate and participation in class or laboratory discussions		• Class discussions • Research activities	• Performance on in-practical exams. • Work on research activity. • Overall student performance in Lab. discussions • Cross questions after finishing laboratory work
4.0	**Communication, Information Technology, Numerical**		
• Evaluate the different methods of preparation of organic compounds • Demonstrate a synthetic pathways for synthesis of organic molecules • Enhancing the ability of students to use computers and internet. • Interpret chemical data • Present chemical data orally. • Know how to write a report.		• Lectures • Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
5.0	**Psychomotor**		

	Laboratory practice . including 1.Locate Materials Safety Data Sheets, chemicals carcinogens list, and hazardous chemicals list. 2. Handle chemicals safely with a proper PPE 3.Dilute solutions, repeat analysis and calculate true result for all procedures performed as required. 4. Dispose the hazardous solution in right way	Practical session should include both demonstration and experiments .	1.Repetition of the experiments , to reproduce the results 2.Written report of chart and procedures. 3.The students should be able to correlate their results with experimental conditions

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	Midterm Exam.	8	20 %
3	Practical Exam.	14	30 %
4	Final Exam.	16	40 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

- T. W. Graham Solomons, Craig B. Fryhle, Scott A. Snyder "*Organic Chemistry, 11th Edition, International Student Version*" **2013**, John Wiley & Sons.
- John McMurry's "*Organic Chemistry, 8th edition, International Edition*" **2011**, Brooks/Cole
-

2. List Essential References Materials (Journals, Reports, etc.)

• Lecture Hand outs available on the coordinator website
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc) • Amit Arora "*Introductory Organic Chemistry*" **2006**, Discovery Publishing House New Delhi • M. Casey, J. Leonard, B. Lygo, G. Procter "*Advanced Practical Organic Chemistry*" 1990, Springer US
4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.) • **http://www.chemweb.com** • **http://www.sciencedirect.com** • **http://www.rsc.org**
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) • **Classrooms capacity (30) students.** • **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.) ▪ **Room equipped with computer and projector and TV.**
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) • **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching Complete the questionnaire evaluation of the course in particular.
2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor • **Observations and the assistance of colleagues.** • **Independent evaluation for extent to achieve students the standards.** • **Iindependent advice of the duties and tasks.**
3 Processes for Improvement of Teaching

- **Workshops for teaching methods.**
- **Continuous training of member staff.**
- **Review of strategies proposed.**
- **Providing new tools for learning.**
- **The application of e-learning.**
- **Eexchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: **Professor Mohamed R. Shaaban**

Signature: **Date Report Completed: 2015**

Received by: Dr. Ismail Althagafi **Department Head**

Signature: ________________________________ **Date:** _______________

Kingdom of Saudi Arabia
National Commission for
Academic Accreditation & Assessment

المملكـــة العربيـــة السعوديـــة
الهيئـــة الوطنيـــة للتقـويـم
والاعـــتـــمـــاد الأكـــاديـــمـــي

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Chemistry of Aromatic Compounds

4022142-3
Course Specifications
(CS)

Course Specifications

Institution: **Umm Al-Qura University** Date of Report:

College/Department : **Faculty of Applied Science/ department of chemistry**

A. Course Identification and General Information

1. Course title and code: **Chemistry of Aromatic Compounds /4022142-3**
2. Credit hours: **3 hrs (2 theoretical + 1 practical)**
3. Program(s) in which the course is offered. **Chemistry program**
4. Name of faculty member responsible for the course: **Dr. Heba Abd Elhady Mohamed**
5. Level/year at which this course is offered: **4rd level / 2st year**
6. Pre-requisites for this course (if any): **-Chemistry of Aliphatic Compounds**
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **both on El-Abdyah and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. **Traditional classroom** ☒ What percentage? **100%**

b. Blended (traditional and online) ☐ What percentage?

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage? ☐

Comments:

B Objectives

1. What is the main purpose for this course? **By the end of this course student will be familiar with basic concepts in aromatic chemistry including dividing, naming, preparation, physical and chemical properties.**
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) • simulating evolution in the science of chemistry by trying to add new items on some points of the course • diversify of learning sources for the course to benefit from more than one reference • comparison of contents with that introduced in deferent local and international departments • use of smart classes for lectures • Encouragement of students to make reports in aromatic chemistry from libraries or by using internet (Self-study)

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
1. Aromaticity: Huckelrule and annulenes 2. Benzene: molecular orbital theory point of view, stability and resonance	1	2
3. Chemical properties of benzene: friedel-crafts reactions and their applications in organic syntheses	1	2
4. Electrophilic substitution reactions	1	2
5. Reactivity and orientation in benzene ring – second electrophilic substitution	1	2
6. Reactivity and orientation in benzene alkyl derivatives	2	4
7. Aromatic amines and their derivatives.	1	2
8. Sulfonic acids and their derivatives.	1	2
9. Phenols and their derivatives.	1	2
10. Aromatic aldehydes and ketones.	2	2
11. Aromatic carboxylic acids and their derivatives.	1	2
12. Poly nuclear aromatic hydrocarbons – diphenyl benzedene derivatives.	1	2
13. Condensed aromatic hydrocarbons - Cancer-causing hydrocarbons.	2	4

Laboratory Part:

I- Investigation and identification of the following

a. Aromatic hydrocarbons
b. Aromatic amines

c. Phenols
d. Aromatic aldehydes and ketones
e. Aromatic carboxylic acids
f. Sulfonic acids

II-General scheme for identification of organic aromatic unknown

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	-		42		70
Credit	2	-		1		3

3. Additional private study/learning hours expected for students per week.
Two hours for preparing and discussion of reports and solving home works in addition to the main time of lectures

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	**Course Teaching Strategies**	**Course Assessment Methods**
1.0	**Knowledge**		
1.1	Define aromatic compounds and aromaticity	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • long and short essays • providing various posters
1.2	Name different organic classes using common and IUPAC system		
1.3	classify different aromatic families		
1.4	Describe the different methods of preparations of aromatic compounds		
1.5	Familiar with the physical properties of different aromatic compounds and their relation with the structure		
1.6	Select the proper method of conversions among different aromatic compounds		
	Recognize the chemical properties of aromatic compounds		
1.7	Write a mechanism of electrophilic aromatic substitution reactions.		
1.8	Explain the products of different aromatic reactions		
1.9	Recognize the industrial use of most famous organic molecules		
2.0	**Cognitive Skills**		

2.1	Train to choose the suitable method for the preparation of aromatic compounds		
2.2	Apply the IUPAC rules for all aromatic families	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • posters • demonstrations
2.3	Choose the suitable mechanism for reactions		
2.4	Explain the different strategies for preparation of aromatic compounds		
2.5	Analyze the reasons for the unique physical properties in some organic compounds		
2.6	Predict the expected product in different aromatic reactions according to the functional group		
2.7	Summarize the different reactions of aromatic compounds		
3.0	**Interpersonal Skills & Responsibility**		
Have the following skills • Ability to work in a team to perform a specific experimental tasks. • Ability to work independently to handle chemicals • Ability to communicate results of work to classmate and participation in class or laboratory discussions		• Class discussions • Research activities	• Performance on in-practical exams. • Work on research activity. • Overall student performance in Lab. discussions • Cross questions after finishing laboratory work
4.0	**Communication, Information Technology, Numerical**		
• Research using computer to collect the data used in writing reports • Illustrate sources of new researches which are related to the course by researching in the internet • Able to calculate and discuss the facts and logical propose methods to solve the difficulties. • Ability to work in a team to perform a specific task.		• Using computers lab • Research centers visit • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
5.0	**Psychomotor** NOT APPLICABLE		
	Laboratory practice . including 1.Locate Materials Safety Data Sheets, chemicals carcinogens list, and hazardous chemicals list. 2. Handle chemicals safely with a proper PPE 3.Dilute solutions, repeat analysis and calculate true result for all procedures performed as required. 4.Dispose the hazardous solution in right way	Practical session should include both demonstration and experiments .	1.Repetition of the experiments , to reproduce the results 2.Written report of chart and procedures. 3.The students should be able to correlate their results with experimental conditions

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homeworks and activities.	All the term	10 %
2	Midterm Exam.	8 or 9	20 % **(Exam time is 60 minute)**
3	Activity in lab and practical Exam	All the term and the final exam at the 15th week	30 % **(Exam time is 180 minute)**
4	Final Exam.	16	40 % **% (Exam time is 120 minute)**
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

- John McMurry's "*Organic Chemistry, 8th edition, International Edition*" **2011**, Brooks/Cole

2. List Essential References Materials.

1. Amit Arora "*Introductory Organic Chemistry*" **2006**, Discovery Publishing House New Delhi
2. John McMurry's "*Organic Chemistry, 8th edition, International Edition*" **2011**, Brooks/Cole
3. T. W. Graham Solomons, Craig B. Fryhle, Scott A. Snyder "*Organic Chemistry, 11th Edition, International Student Version*" **2013**, John Wiley & Sons.

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com**
- **http://www.sciencedirect.com**
- **http://www.rsc.org**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)
   - **Classrooms capacity (30) students.**
   - **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

   - **Room equipped with computer and projector and TV.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)
   - **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching
Complete the questionnaire evaluation of the course in particular.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor
- **Observations and the assistance of colleagues.**
- **Independent evaluation for extent to achieve students the standards.**
- **Independent advice of the duties and tasks.**

3 Processes for Improvement of Teaching
- **Workshops for teaching methods.**
- **Continuous training of member staff.**
- **Review of strategies proposed.**
- **Providing new tools for learning.**
- **The application of e-learning.**

- **Eexchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: Organic Chemistry Staff Members
Coordinator Dr. Heba Abd Elhady Mohamed

Signature: **Date Report Completed: 2015**

Received by: Dr. Ismail Althagafi Department Head

Signature: _________________________________ Date: ________________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Heterocyclic Chemistry

4023556-3

Course Specifications
(CS)

Course Specifications

Institution: **Umm Al-Qura University** Date of Report: **2018**

College/Department : **Faculty of Applied Science/ Department of Chemistry**

A. Course Identification and General Information

1. Course title and code: **Heterocyclic Chemistry /4023556-3**
2. Credit hours: **3 hrs (2 theoretical + 1 practical)**
3. Program(s) in which the course is offered: **Chemistry program**
4. Name of faculty member responsible for the course: **Dr. Rasha El-Demerdashi El-Mekawi**
5. Level/year at which this course is offered: **5th level/3 year (1st term)**
6. Pre-requisites for this course (if any): **Chemistry of aromatic compounds (4022142-3)**
7. Co-requisites for this course (if any): **Chemistry of Organic Reactions and Preparation (4023565-3)**
8. Location if not on main campus: **both on El-Abdyah and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom	☐	What percentage?	☐
b. Blended (traditional and online)	☒	What percentage?	**90** %
c. e-learning	☒	What percentage?	**10** %
d. Correspondence	☐	What percentage?	☐
f. Other	☐	What percentage?	☐

Comments:

B Objectives

1. What is the main purpose for this course? ☒ **By the end of this course student will be familiar with Studying trivial and systematic nomenclature, chemical properties and synthesis of different heterocyclic compounds**.
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field ☒ **The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course**

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	**No. of Weeks**	**Contact Hours**
a- Classification of heterocyclic compounds	1	2
b- Nomenclature of monocyclic heterocyclic compounds as well as fused systems	2	4
c- Bonding, Structure and geometry in heterocyclic compounds: three, four, five and six membered heterocycles-Aromaticity – Basicity	2	4
d- Structure and reactivity of different heterocycles five and six-membered rings with one or more different heteroatoms (same or different heteroatoms).	2	4
e- Chemical reactions of different heterocyclic compounds five and six-membered rings with one or more different heteroatoms (same or different heteroatoms).	2	4
f- Cycloaddition reactions (Diels-Alder [2+4]) of different heterocyclic compounds five and six-membered rings with one or more different heteroatoms (same or different heteroatoms).	1	2

g- Synthetic Routes to five membered rings with one or more different heteroatoms (same or different heteroatoms).	1	2
h- Synthetic Routes to six membered rings and fused heterocyles with one heteroatom.	1	2
i- Synthetic Routes to six membered rings with two heteroatoms (Diazines) (pyrimidine and pyrazine)	1	2

Laboratory Part:

1- Identifying the protocol of security and safety in lab. and developing of the environmental awareness
2- Synthesis of phthalimide
3- Synthesis of phthalaylglycine
4- Synthesis of benzimidazole
5- Synthesis of benzotriazole
6- Synthesis of 1, 2, 3, 4-tetrahydrocarbazole
7- Synthesis of 3-methyl-1-phenyl-5-pyrazolone
8- Synthesis of 7-hydroxy-4-methyl coumarin
9- Synthesis of 3, 4-dihydro-1-hydroxy-4-oxo phthalazine
10- Synthesis of 4-benzylidene-2-methyloxyazol-5-one
11- Synthesis of 5, 5-diphenyl hydantoin
12- Synthesis of 2, 4, 5-triphenyl oxazole

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	26	-	36			62
Credit	2	-	1			3

3. Additional private study/learning hours expected for students per week. 2hr

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching	Course Assessment

		Strategies	Methods
1.0	**Knowledge**		
1.1	Studying the molecular structures of different heterocyclic compounds	• Lectures • Scientific discussion • Library visits • Web-based study • E-learning	• Exams • web-based student performance systems • portfolios • long and short essays • posters lab manuals • Homework • Periodic Short exams
1.2	Describing the classification of heterocyclic compounds according to their different types		
1.3	Knowledge of different methods for nomenclature of heterocyclic compounds		
1.4	Showing the multiple methods of preparation of heterocyclic compounds		
1.5	Recognizing the chemical properties of heterocyclic compounds		
1.6	Identifying the chemical reactions of different heterocyclic compounds		
2.0	**Cognitive Skills**		
2.1	Development of reverse thinking skill (back thinking) and the student's acquiring the training skill to choose the suitable method for heterocyclic compounds preparation	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • posters • demonstrations
2.2	Making the student acquire the skill of naming heterocyclic compounds		
2.3	The studen't acquiring of the skill of how to predict the outcomes of interactions of heterocyclic compounds		
2.4	The student can pick the appropriate methods for the preparation of heterocyclic compounds		
2.5	Design of different ways to nomenclature the heterocyclic compounds		
2.6	Student invents different ideas for the construction of many of the heterocyclic compounds		
2.7	The student is planning to make a research programme in the field of chemistry of heterocyclic compounds and their effectiveness		
3.0	**Interpersonal Skills & Responsibility**		
	• Ability to work in a team to perform a specificexperimental tasks. • Ability to work independently to handle chemicals • Ability to communicate results of work to classmate and participation in class or laboratory discussions	• Class discussions • Research activities	• Performance on in-practical exams. • Work on research activity.

			• Overall student performance in Lab. discussions • Cross questions after finishing laboratory work
4.0	**Communication, Information Technology, Numerical**		
4.1	The ability to conduct a successful style of dealing with data analysis, describing his strategy in the image and draw conclusions from them	• Lectures • Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
4.2	Introductory lecture at the beginning of the semester to use the computer and the internet to search for sources of new researches and collect the researches which help in writing reports on topics related to syllabus.		
4.3	Evaluating the performance of the students through examination, duties and the discussion in the lecture which constitute 30 % of the total evaluation.		
5.0	**Psychomotor**		
	Not Applicable		

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	**Midterm Exam**	**5-14**	**20%**
2	**Assignments (Homework + Activities+ Attendance +periodic short exams)**		**10 %**
3	**Practical Exam**	**15**	**30%**

4	**Final Exam**	**16**	**40%**
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

- Eric Scriven, Christopher A. Ramsden "Advances in heterocyclic chemistry" 1st Ed., published: 1st June, Vol. 126, 2018. **Hardcover ISBN:** 9780128152096, **Imprint:** Academic Press. Elsevier
- Eric Scriven, Christopher A. Ramsden "Advances in heterocyclic chemistry" 1st Ed., published: 3rd February, Vol. 125, 2018. **ardcover ISBN:** 9780128152102, **Imprint:** Academic Press. Elsevier.
- Eric Scriven, Christopher A. Ramsden "Advances in heterocyclic chemistry" 1st Ed., published: 4th January, Vol. 124, 2018. **E-Book ISBN:** 9780128137611, **Hardcover ISBN:** 9780128137604, **Imprint:** Academic Press, Elsevier
- Gordon Gribble, John Joule "Progress in heterocyclic Chemistry" 1st Ed., Published: 5th September, Vol. 29, 2017. **E-Book ISBN:** 9780081023112, **Hardcover ISBN:** 9780081023105, **Imprint:** Elsevier
- Alan R. Katritzky, Christopher A. Ramsden, John A. Joule " Advances in heterocyclic Chemistry" 1st Ed., Published 7 Novmber, Vol. 113, 2014. **ISBN** 10 0080958435, **ISBN** 13 9780080958439, I**mprint**: Elsevier / The Lancet

2. List Essential References Materials (Journals, Reports, etc.)

- Lecture Hand outs available on the coordinator website

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

- Eric Scriven, Christopher A. Ramsden "Advances in heterocyclic chemistry" 1st Ed., published: 4th April, Vol. 123, 2017. **E-Book ISBN:** 9780128121955, **Hardcover ISBN:** 9780128120927, **Imprint:** Academic Press, Elsevier.
- Eric Scriven, Christopher A. Ramsden "Advances in heterocyclic chemistry" 1st Ed, published: 25th March, Vol. 122, 2017. **E-Book ISBN:** 9780128119938, **Hardcover ISBN:** 9780128119730, **Imprint:** Academic Press Elsevier.
- Eric Scriven, Christopher A. Ramsden " Heterocyclic Chemistry in the 21st century: A Tribute to Alan R. Katritzky" 1st Ed., Published: 4th January Vol. 121, 2017. **E-Book ISBN:** 9780128120705, **Hardcover ISBN:** 9780128111741, **Imprint:** Academic Press
- Gordon Gribble, John Joule "Progress in heterocyclic Chemistry" 1st Ed., Published: 3rd September, Vol. 28, 2016. **E-Book ISBN:** 9780080994093, **Hardcover ISBN:** 9780080994062, **Imprint:** Elsevier

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com**
- **http://www.sciencedirect.com**
- **http://www.rsc.org**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)
   - **Classrooms capacity (30) students.**
   - **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)
   - **Room equipped with computer and projector and TV.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)
   - **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching
Complete the questionnaire evaluation of the course in particular.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- **Observations and the assistance of colleagues.**
- **Independent evaluation for extent to achieve students the standards.**
- **Iindependent advice of the duties and tasks.**

3 Processes for Improvement of Teaching

- **Workshops for teaching methods.**
- **Continuous training of member staff.**
- **Review of strategies proposed.**
- **Providing new tools for learning.**
- **The application of e-learning.**
- **Eexchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: **Dr/ Rasha El-Mekawy**

Signature: Rasha **Date Report Completed: 2018**

Received by: Dr Ismail I. Althagafi **Department Head**

Signature: ________________________________ Date: ________________

Kingdom of Saudi Arabia
National Commission for
Academic Accreditation & Assessment

المملكـة العربيـة السعوديـة
الهيئـــة الوطنيـــة للتقـويـم
والاعـتـمـاد الأكـاديـمـي

Course Specifications

Physical Organic Chemistry

4023551-3

2016

Course Specifications

Institution Umm Al-Qura University.	Date of Report 13/3/2016
College/Department: Faculty of Applied Science - Department of Chemistry.	

A. Course Identification and General Information

1. Course title and code: Physical organic chemistry/ **4023551-3**
2. Credit hours: 3 hrs (theoretical).
3. Program(s) in which the course is offered: Chemistry
(If general elective available in many programs indicate this rather than list programs)
4. Name of faculty member responsible for the course: **Prof. Dr. Thoraya A. Farghaly**
5. Level/year at which this course is offered: 4/2.
6. Pre-requisites for this course (if any): Aromatic Chemistry
7. Co-requisites for this course (if any)
8. Location if not on main campus: **both on El-Abdyah and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom	√	What percentage?	%100
b. Blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. Correspondence		What percentage?	
f. Other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course? A full knowledge of the basic concepts of physical organic chemistry including the mechanism of chemical reactions. Study the stereochemistry in different reaction types is also involved and chirality.
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) • Using smart classes for teaching in lectures. • The students will be encouraged to prepare an essay or a report from literature by using the library, data base services, and/or internet to follow up and update the new topics of the physical organic chemistry and stereochemistry course.

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact Hours
▪ Thermodynamic parameters affected the reactions. ▪ Reaction kinetic and determination of the reaction orders. ▪ Determination of reaction mechanism by physical and chemical properties.	2	6
▪ Factors affecting the distribution of electrons in molecules: (Inductive effect- Mesomeric effect- Steric effect).	1	3
▪ Nucleophilic substitution reaction SN^1 and SN^2.	2	6

▪ Elimination reactions E1 and E2.		3
▪ Exam 1		
▪ Electrophilic addition to carbon-carbon double bond. ▪ Nucleophilic addition to carbonyl group.	1	3
▪ Free radicals reactions.	1	3
▪ Solvent effect on chemical reactions. ▪ The chemistry of the reactive intermediate such as carboanion, carbocation, carbens and free radicals.	1	3
▪ Introduction to stereochemistry: Isomerism - Configuration - shape and types of isomerism: structural and conformational.	1	3
▪ conformational isomerism, Geometrical isomerism, Optical isomerism	2	6
▪ Chiral study and their properties.	1	3
• Compounds that contain more than one chiral carbon atom - Diastercomers and their properties.	1	3
• Revision	1	3
• Exam 2		

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	42	-	-	-	-	42
Credit	3					3

3. Additional private study/learning hours expected for students per week. - ☐

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
	1- Memorize of the basic rules in organic chemistry. 2- Understand of the division of types of electronic effects of groups in molecules. 3- Knowledge and understanding of the mechanism of different types of organic reactions. 4- Understand SN1 and SN2 Mechanisms. 5- Knowledge of types of isomerism. 6- Draw a shape of open and cyclic compounds. 7- Understand of the absolute configuration. 8- Knowledge of Diastercomers and their properties and Molecular Chirality.	1-Using open discussion to link the previous knowledge to the current and future topics. 2-The students use the internet to prepare an essay about a recent advances related to the course of physical organic chemistry and stereochemistry.	• Homework . • Oral discussion. • Assignments.

2.0	**Cognitive Skills**		
	○ To acquire skills to different types of electronic effects in molecules. ○ To acquire skills to know the path of interaction and then find out mechanism. ○ Developing skills of drawing shape of the stereochemistry of organic compounds. ○ Understanding of the different types of isomerism.	• Using brain storming at the beginning of each lecture in order to stimulate the students towards the new topic of the course. • Enhancing open discussion during the lecture	• Assignments • Homework
3.0	**Interpersonal Skills & Responsibility**		
	➢ Divide the student in to teams to perform some joint reports. ➢ The development of the student to accepts the opinion of his colleague in his participation to perform an active presentation for the topic related to the course, and evaluate the results to find out the response of students for the collective cooperation.	• Encourage the solving problems in groups during lecture. • Making open discussion about certain recent topic of the course.	Homework and group reports.

4.0	**Communication, Information Technology, Numerical**		
	- Communicate effectively in oral and written forms. - Using information and communication technologies. - Using basic mathematical and statistical techniques.	❖ Using computer lab. ❖ Visiting the Central Library. ❖ Using international information network.	○ Ask questions in the tests to explanation for simple statistical information. ○ Assessing the duties associated with suitable use of communication skills and numerical.
5.0	**Psychomotor**		
	Non-requirement in the curriculum**.**	Non-requirement in the curriculum**.**	Non-requirement in the curriculum**.**

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	First Periodic Exam.	6	20 %
3	Second Periodic Exam.	12	20 %
4	Final Exam.	16	50 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- We have faculty members to provide counseling and advice.
- Office hours: During the working hours weekly.
- Academic Advising for students.

E. Learning Resources

1. List Required Textbooks

1- "Modern Physical Organic Chemistry" Eric V. Anslyn, Texas, Austin Dennis A. Dougherty, University Science Books Sausalito, California, 2005.
2-Howard Maskill "*Structure and Reactivity in Organic Chemistry, Volume 81 of Oxford Chemistry Primers*" 1999, OUP Oxford.

2. List Essential References Materials (Journals, Reports, etc.)

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

1. John McMurry's "*Organic Chemistry, 8th edition, International Edition*" 2011, Brooks/Cole.

2. T. W. Graham Solomons, Craig B. Fryhle, Scott A. Snyder "*Organic Chemistry, 11th Edition, International Student Version*" 2013, John Wiley & Sons.

3. R. K. Sharma "*Stereochemistry, Volume 4*" **2008**, Discovery Publishing House.
4. Michael J. T. Robinson "*Organic Stereochemistry*" **2000**, OUP Oxford.

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- http://www.chemweb.com
- http://www.sciencedirect.com
- http://www.rsc.org

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

- Microsoft PowerPoint, Microsoft Word, Microsoft Excel.
- Videos on physical organic chemistry.
- CD for learning physical organic chemistry.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- Classrooms capacity (30) students.
- Providing hall of teaching aids including computers and projector.

2. Computing resources (AV, data show, Smart Board, software, etc.)

- Room equipped with computer and projector and TV.

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

No other requirements.

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Complete the questionnaire evaluation of the course in particular.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- ✓ Observations and the assistance of colleagues.
- ✓ Independent evaluation for extent to achieve students the standards.
- ✓ Iindependent advice of the duties and tasks.

3 Processes for Improvement of Teaching

- Workshops for teaching methods.
- Continuous training of member staff.
- Review of strategies proposed.
- Providing new tools for learning.
- The application of e-learning.
- Eexchange of experiences internal and external.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- Check marking of a sample of exam papers, or student work.
- Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- Periodic Review of the contents of the syllabus and modify the negatives.
- Consult other staff of the course.
- Hosting a visiting staff to evaluate of the course.
- Workshops for teachers of the course.

Faculty or Teaching Staff: **Prof. Dr. Thoraya A. Farghaly**

____

Signature: _________________________________ **Date Report Completed: 13/3/2016**

Received by: _ Dr. Ismail Althagafi **Department Head**

Signature: _________________________________ **Date: _______________**

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Organic Spectroscopy

4023561-3
Course Specifications
(CS)

Course Specifications

Institution: **Umm Al-qura University**	Date of Report: **2017**
College/Department : **Faculty of Applied Science/ department of chemistry**	

A. Course Identification and General Information

1. Course title and code: **Organic Spectroscopy** / **4023561-3**
2. Credit hours: **3 hrs (2 theoretical + 1** Tutorial**)**
3. Program(s) in which the course is offered. **Chemistry**
4. Name of faculty member responsible for the course: **Dr.Hossa fahad alshareef**
5. Level/year at which this course is offered: **5th level/3rd year**
6. Pre-requisites for this course (if any): **Physical Organic Chemistry and Stereochemistry**
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **both on El-Abdyah and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ☒ What percentage? **100%**

b. Blended (traditional and online) What percentage?

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage? ☐

Comments:

B Objectives

1. What is the main purpose for this course? **By the end of this course student will be familiar with compounds analysis by (UV-Spectroscopy , Infra-Red Spectroscopy ,NMR-Spectroscopy,Mass Spectroscopy)**
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) **The students will be training to using data base services, and/or websites to improving interpretation of compounds with spectroscopy**

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
1- Principals of spectroscopy and index of hydrogen deficiency.	**1**	**2**
2- UV Spectroscopy: ground and excited states, molar absorptivity, an calculation of A max to the possible structure.	**2**	**4**
3- Applications and solving problems.	**1**	**2**
4- Factors affecting absorption frequency, experimental aspects of IR spectroscopy.	**1**	**2**
5- Interpretation of IR charts.	**1**	**2**
6- The nature of NMR absorption instrumentation; chemical shifts in 1H NMR spectroscopy.	**1**	**2**
7- Shielding and de shielding effect magnetic anisotropy, spin-spin coupling in 1H NMR spectroscopy.	**2**	**4**
8- ^{13}C NMR spectroscopy (chemical shift);more complex spin-spin splitting patterns.	**1**	**2**
9- Mass Spectrometry (MS): ionization process and instrumentation.	**1**	**2**
10- Examples of common types of fragmentation processes.	**1**	**2**
11- Applications and solving problems.	**1**	**2**
12- Apply all Spectra.	**1**	**2**

Tutorial Part:

1- interpretation and confirmation of compounds of the following

- **a. interpretation of IR charts**
- **b. interpretation of ^{1}H NMR chart**
- **c. interpretation of ^{13}C NMR chart**
- **d. interpretation of Mass(MS) chart**

2- applications and solving problems contain all spectra.

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	**28**	**42**	**----**	**----**	**----**	**70**
Credit	**2**	**1**	**----**	**----**	**----**	**3**

3. Additional private study/learning hours expected for students per week. 4hr

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	**Course Teaching Strategies**	**Course Assessment Methods**
1.0	**Knowledge**		
1.1	Recognize the general Principals of different spectroscopy.	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • long and short essays • posters • lab manuals
1.2	Know position the functional groups in infra red		
1.3	Describe the compounds with spectroscopy		
1.4	Familiar with the factors affecting absorption frequency		
1.5	Determine the type and numbers of signals for NMR spectra in the different compounds		
1.6	Identify the examples of common types of fragmentation processes		
2.0	**Cognitive Skills**		
2.1	Apply the spectroscopy steps for all compounds .	• Scientific discussion	• Exams • web-based student performance systems
2.2	Predict the structure of compounds with study spectroscopy		

2.3	Compare between methods spectroscopy .	• Library visits • Web-based study	• portfolios • posters • individual and group presentations • video analsis • lap manuals
2.4	Explain the different Benefits for study organic spectroscopy		
2.5	Summarize the spectroscopy of organic compounds		
2.6	development Reverse thinking skill (back thinking)		
3.0	**Interpersonal Skills & Responsibility**		
	• Use the spectroscopy for Discovers the structure of compound . • justify the structure of compound according to spectroscopy • Ability to communicate results of work to classmates. • Ability to work in a team to perform a specific task.	• Library visits • Scientific discussion • Web-based study	• web-based student performance systems • individual and group presentations
4.0	**Communication, Information Technology, Numerical**		
	• Demonstrate structure for organic compounds with spectroscopy • Use information and communication technology. • The ability to use e-mail to communicate with the instructor and other students. • Scientific writing. • Use his/her observations to solve problems.	• Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
5.0	**Psychomotor**		
5.1	NOT APPLICABLE		
5.2			

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	Midterm Exam.	8	20 %
3	Practical Exam.	14	30 %
4	Final Exam.	16	40 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

- Pavia, D.; Lampman, G.M.; Kriz, G.S.; Vyvyan, J.R. Introduction to Spectroscopy, 4 th edition, 2009, Belmont : Brooks/Cole, Cengage Learning.
- Silverstein, R.M.; Webster, F.X.; Kiemle, D.J. Spectrometric Identification of Organic Compounds. 7th edition, 2005, N.Y. : John Wiley & Sons, Inc.
- Prof.Dr.AbdullahM.Asiri,MahaM.Al-Otaibi"*Spectroscopic Methods in Organic Chemistry, 1st Edition,* 2012.

2. List Essential References Materials (Journals, Reports, etc.)

Prof.Dr.Abdullah M.Asiri,Dr.Abood Bahajaj " *Principles of Spectroscopic Analysis of Organic Compounds*"

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

- R.T.Morrison ,R.N.Boyd,S.K.Bhattacharjee " *Organic Chemistry*" 7th **2011**,

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com**
- **http://www.sciencedirect.com**
- **http://www.rsc.org**
- http://stream.hebust.edu.

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)
   - **Classrooms capacity (30) students.**
   - **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

- **Room equipped with computer and projector and TV.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

Complete the questionnaire evaluation of the course in particular.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- **Observations and the assistance of colleagues.**
- **Independent evaluation for extent to achieve students the standards.**
- **Iindependent advice of the duties and tasks.**

3 Processes for Improvement of Teaching

- **Workshops for teaching methods.**
- **Continuous training of member staff.**
- **Review of strategies proposed.**
- **Providing new tools for learning.**
- **The application of e-learning.**
- **Eexchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: **Dr.Hossa fahad alshareef**

Signature: **Date Report Completed: 2017**

Received by: Dr. Ismail Althagafi **Department Head**

Signature: ________________________________ Date: ________________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Polymer Chemistry

4024581-3
Course Specifications
(CS)

Course Specifications

Institution: **Umm Al-qura University** Date of Report: **2015**

College/Department : **Faculty of Applied Science/ department of chemistry**

A. Course Identification and General Information

1. Course title and code: **Polymer Chemistry 4024581-3**
2. Credit hours: **3 (2+1)**
3. Program(s) in which the course is offered. **Chemistry program**
4. Name of faculty member responsible for the course: **Dr. Essam M. Hussein**
5. Level/year at which this course is offered: **8st level / 4th year**
6. Pre-requisites for this course (if any): **Petroleum chemistry and Petrochemicals**
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **both on El-Abedyah, El-Azizya, and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ☒ What percentage? **100%**

b**. Blended (traditional and online)** What percentage?

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage? ☐

Comments:

B Objectives

1. What is the main purpose for this course? **This course aimed to study the preparation of polymers as well as understanding their physical and mechanical properties, applications, and its economic importance.**
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) **The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course**

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
a. Introduction and definitions	1	2
b. Basic principles of polymer classification – Polymer architecture – Types of polymers	1	2
c. Molecular weight of polymers	1	2
d. Condensation polymers - addition polymer	2	4
e. Mechanisms of polymerization reactions - copolymerization	1	2
f. Physical properties of polymers	2	4
g. Thermal transitions of polymers: glass transition state Tg – factors affecting on Tg	2	4
h. Polymer uses and future applications	2	4
i. Mechanical properties of polymers	1	2
j. Industrial synthesis of polymers and technology	1	2

Laboratory Part:

I- Synthesis of different polymeric copmpounds

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	-	42			70
Credit	2	-	1			3

3. Additional private study/learning hours expected for students per week. 2hr

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Identify the basic principles of polymer classification	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • long and short essays • posters lab manuals
1.2	identify different methods to determine the molecular weight of polymers		
1.3	Recognize the different methods used in the preparation of polymers		
1.4	Write the products of polymerization reaction correctly		
1.5	Recognize the different types of polymers		
1.6	Determine the type of mechanism of polymerization reactions		
1.7	Familiar with the basic knowledge about the thermal transitions of polymers		
1.8	Familiar with the basic knowledge about the importance and applications of polymers in industry		
1.9	Familiar with the mechanical properties of different polymers		
1.10			
2.0	**Cognitive Skills**		
2.1	Explain the physical properties of polymers	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • posters • demonstrations
2.2	Compare between the different methods of polymerization		
2.3	Explain the reaction mechanisms for different polymerization reactions		
2.4	Summarize the different methods used to synthesis of different types of polymers		
2.5	Explain the factors affecting glass transition state (Tg) of polymers		
2.6	Apply the different laboratory techniques to synthesis of polymer molecules		
2.7	Predict the future applications of polymers		
3.0	**Interpersonal Skills & Responsibility**		

	• Ability to work in a team to perform a specific experimental tasks. • Ability to work independently to handle chemicals • Ability to communicate results of work to classmate and participation in class or laboratory discussions	• Class discussions • Research activities	• Performance on in-practical exams. • Work on research activity. • Overall student performance in Lab. discussions • Cross questions after finishing laboratory work
4.0	**Communication, Information Technology, Numerical**		
	• Evaluate the different methods to synthesis of types of polymers • Enhancing the ability of students to use computers and internet. • Interpret chemical data • Present chemical data orally. • Know how to write a report. • Demonstrate a synthetic pathways for synthesis of polymer molecules • Demonstrate the different applications of polymers in industry	• Lectures • Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
5.0	**Psychomotor**		
5.1 5.2	Laboratory practice . including 1.Locate Materials Safety Data Sheets, chemicals carcinogens list, and hazardous chemicals list. 2. Handle chemicals safely with a proper PPE 3.Dilute solutions, repeat analysis and calculate true result for all procedures performed as required. 4.Pipette accurately at all times 5. Titrate and weight efficiently in right way 6.Dispose the hazardous solution in right way	Practical session should include both demonstration and experiments .	1.Repetition of the experiments , to reproduce the results 2.Written report of chart and procedures. 3.The students should be able to correlate their results with experimental conditions

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Exam	5-14	20%
2	Assignments		10%
3	Practical Exam	15	30%
4	Final Exam. (2hours exam)	16	40%

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

- L. H. Sperling, *Introduction to Physical Polymer Science*, 4th Edition, Wiley, **2006**.
- I. M. Ward and J. Sweeney, *An Introduction to The Mechanical Properties of Solid Polymers*, 2nd Edition, Wiley, **2004**. (TA455.P58 W36 2004).
- Stanley R. Sandler, *Polymer Synthesis*, Vol. III, Academic Press, **1980.**
- Stanley R. Sandler, *Polymer Synthesis*, Vol. I, Academic Press, **1974.**

2. List Essential References Materials (Journals, Reports, etc.)

- Lecture Hand outs available on the coordinator website

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

1. John McMurry's "*Organic Chemistry, 8th edition, International Edition*" **2011**, Brooks/Cole.

-

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

• **http://www.chemweb.com** • **http://www.sciencedirect.com** • **http://www.rsc.org**
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) • **Classrooms capacity (30) students.** • **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.) ▪ **Room equipped with computer and projector and TV.**
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) • **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching Complete the questionnaire evaluation of the course in particular.
2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor • **Observations and the assistance of colleagues.** • **Independent evaluation for extent to achieve students the standards.** • **Iindependent advice of the duties and tasks.**
3 Processes for Improvement of Teaching • **Workshops for teaching methods.** • **Continuous training of member staff.** • **Review of strategies proposed.** • **Providing new tools for learning.** • **The application of e-learning.** • **Eexchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: **Dr. Essam M. Hussein**

Signature: **Date Report Completed: 2015**

Received by: Dr. Ismail Althagafi **Department Head**

Signature: __________________________________ Date: ________________

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

COURSE SPECIFICATION

Petroleum Chemistry

4023752-3

Revised March 2016

Course Specification

For Guidance on the completion of this template, please refer to of Handbook 2 Internal Quality Assurance Arrangements

Institution Umm Al-Qura University
College/Department Applied Sciences /Chemistry Department

A Course Identification and General Information

Course title and code: **Petroleum Chemistry, 4023752-3**
Credit hours: 3 hrs **(2 theoretical + 1 practical)**
3. Program(s) in which the course is offered. : Industrial Chemistry **(If general elective available in many programs indicate this rather than list programs)**
4. Name of faculty member responsible for the course **Dr. Refaat Alsayed**
5. Level/year at which this course is offered : **5th / 3rd semester (1436-1437)**
6. Pre-requisites for this course (if any) **Aromatic Chemistry**
7. Co-requisites for this course (if any)
8. Location if not on main campus: **Elabdyah**

B Objectives

1. Summary of the main learning outcomes for students enrolled in the course. **Study the theories of petroleum formation, petroleum classifications and quality. Study the fractional distillation of petroleum and its products, the chemical processes.**
2. Briefly describe any plans for developing and improving the course that are being implemented. (eg increased use of IT or web based reference material, changes in content as a result of new research in the field). **The use of smart teaching halls for lectures. Encouraging students to do reports as a self-education for natural gas and it use, Methane hydrate and alternative fuels whether using the library or the Internet.**

C. Course Description

(Note: General description in the form to be used for the Bulletin or Handbook should be attached)

1 Topics to be Covered		
Topic	No of Weeks	Contac thours
Definition of Petroleum and it origin formation and traps	**1**	**3**
Methods of exploration and Petroleum Classification	**1**	**3**
Chemical Composition of Petroleum	**1**	**3**
Field separation of crude oil (Desalting, water treatment, gas treatment)	**2**	**6**
Refining operations and Fractional Distillation of crude oil	**1**	**3**
Crude oil Distillation products: light distillates (natural Gas, gasoline and naphtha) - Mild distillates (kerosene, heating oil and jet fuel and diesel fuel) - heavy distillates (lubricates oil and waxes, asphalt and coke oil).	**3**	**9**
Chemical conversion processes of crude oil: Cracker processes (thermal cracking and catalytic cracking and hydrocracking) - Combining processes (polymerization and alkylation) - Rearrangement processes (catalytic reforming and isomerization and improving the octane and cetane number) - Purification by hydrogen treatment (removing hydrogen sulfide compounds mercaptans and compounds of nitrogen. Etc.).	**3**	**9**

2 Course components (total contact hours per semester):			
Lecture: **28**	Tutorial:	Practical/Fieldwork/Internship: **42**	Other:

3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week)
Almost two hours per week spent by students to prepare reports, discuss and resolve questions, addition to the hours of theoretical lecture basic process.

4. Development of Learning Outcomes in Domains of Learning
For each of the domains of learning shown below indicate:
A brief summary of the knowledge or skill the course is intended to develop;
A description of the teaching strategies to be used in the course to develop that knowledge or skill;
The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

a. Knowledge

(i) Description of the knowledge to be acquired
Knowledge of the various theories for oil formation and oil traps.
Knowledge of oil classification and chemical composition of petroleum.
Knowledge of oil pre-treatment and the field separation.
Knowledge of the different ways fractional distillation of crude oil and distillate in each stage and its products (natural gas, gasoline, kerosene etc.).
Knowledge of manufacturing processes such as chemical process of coking and thermal cracking, catalytic cracking and Hydrogen cracking. Thermal reforming, catalysts reforming etc. ....

(ii) Teaching strategies to be used to develop that knowledge
Scientific discussions and work in small groups.
Use the library to do some research.
Use of the Internet to do some public reports.

(iii) Methods of assessment of knowledge acquired
The final written examinations and mid-semester.
Oral exams.
Discussions.
Systematic research on the relevant subjects.

b. Cognitive Skills

(i) Cognitive skills to be developed
The student acquires the skill of thinking in trying to find the best theory for oil formation because of its economic effects on the oil wealth.
The student acquires knowledge of chemical structures and predict its presence in petroleum distillates.
The student acquires the skill of petroleum distillation according to the boiling point.

Acquire the skill of the possibility of chemical conversion of chemical substance to another theoretically.

(ii) Teaching strategies to be used to develop these cognitive skills

Using brain storming at the beginning of each lecture in order to stimulate the students towards the new topic of the course.

Enhancing open discussion during the lecture.

(iii) Methods of assessment of students cognitive skills

Through assignments and homework.

c. Interpersonal Skills and Responsibility

(i) Description of the interpersonal skills and capacity to carry responsibility to be developed

Take the personality and responsibility for their own learning

Working effectively in groups and exercise leadership when appropriate

Act ethically and consistently with high molar standards in personal and public forms.

Community linked thinking

(ii) Teaching strategies to be used to develop these skills and abilities

Using the computer lab.

Visit the Central Library.

Visit research centres.

The use of international information network.

(iii) Methods of assessment of students interpersonal skills and capacity to carry responsibility

Put in the test questions explanation of the simple. Statistical information.

Evaluation of the duties associated with the proper use of communication skills and numerical mathematical skills.

The allocation of part of the grades to assess the level of use of ICT in the presentation.

d. Communication, Information Technology and Numerical Skills

(i) Description of the skills to be developed in this domain.

(ii) Teaching strategies to be used to develop these skills

(iii) Methods of assessment of students numerical and communication skills

e. Psychomotor Skills (if applicable)

(i) Description of the psychomotor skills to be developed and the level of performance required

Laboratory practice . including

1.Locate Materials Safety Data Sheets, chemicals carcinogens list, and hazardous chemicals list.
2. Handle chemicals safely with a proper PPE
3. repeat analysis and calculate true result for all procedures performed as required.
4.Dispose the hazardous solution in right way

(ii) Teaching strategies to be used to develop these skills

Practical session should include both demonstration and experiments

(iii) Methods of assessment of students psychomotor skills

1.Repetition of the experiments , to reproduce the results
2.Written report of chart and procedures.
3.The students should be able to correlate their results with experimental conditions

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	Midterm Exam.	8	20 %
3	Practical Exam.	14	30 %
4	Final Exam. (2hours exam)	16	40 %
5	**Total**	**100 %**	

D. Student Support

1. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)

Presence of faculty members to provide counseling and means.
Office Hours: weekly during working hours, and to create appropriate means Academic Advising for students to those who need it.

E Learning Resources

1. Required Text(s)
Petroleum and petrochemical course presented by the lecturer.

2. Essential References

J. G. Speight, The Chemistry and Technology of Petroleum, 5th ed. CRC Press, 2014, P. 953, ISBN: 9781439873892.
R. Curley, Fossil Fuels. Britannica, 2012, P. 160, ISBN 9781615305407.
M. A. Fahim, T. A. Alsahhaf, A. Elkilani, Fundamentals of Petroleum Refining, Elsevier, 2010, P. 496, ISBN 9780444527851.
D. S. J. Jones, Peter R. Pujadó, Handbook of petroleum processing, Springer Dordrecht Netherlans, 2006.
- Uttam Ray Chaudhuri. Fundamentals of Petroleum and Petrochemical Engineering. December 13, 2010 by CRC Press.

- James G. Speight. The Chemistry and Technology of Petroleum, 5th. February 26, 2014 by CRC Press

3- Recommended Books and Reference Material (Journals, Reports, etc) (Attach List)
International petroleum encyclopedia, Tulsa, Oklahoma: Pennwell, Corporation, 2007.

4-.Electronic Materials, Web Sites etc
http://en.wikipedia.org/wiki/Petroleum1
http://www.chemhelper.com/
http://www.chemweb.com/
http://www.sciencedirect.com/

5- Other learning material such as computer-based programs/CD, professional standards/regulations
Microsoft Power Point, Microsoft Word.
Video show on thermodynamics.
Learning CD on thermodynamics.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in **classrooms and laboratories, extent of computer access etc.)**

1. Accommodation (Lecture rooms, laboratories, etc.)
Classroom capacity (30) students.
Processing of the classroom with appropriate educational means, including computers

2. Computing resources

Classroom is equipped with a computer, Data Show and TV.

3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

There is no other requirement

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

Complete the questionnaire assessment due in particular.
Focus group discussions with small groups of students.

2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department

Observations and the assistance of colleagues.
Independent evaluation of the extent to which students of the standards.
Independent advice to the duties and tasks.

3 Processes for Improvement of Teaching
Workshops to teaching methods.
Ongoing training of faculty member.
Review the proposed strategies.
Providing modern tools necessary for learning.
Application of the means of e-learning.
The exchange of internal and external expertise

4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)

Examination of a sample of the patch test papers, or student work by an independent faculty member.
Periodic exchange and remarking of a sample of assignments or tests with a faculty member to last the same decision in other educational institution.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

Consultation among professors .
Host a visiting professor to evaluate the course.
Workshops for teachers of the course.
Periodic review of the contents of the course and amend the negatives.

Faculty or Teaching Staff: **Dr. Refaat Alsayed**

Signature: **Date Report Completed: 2015**

Received by: Dr. Ismail Althagafi Department Head

Signature: ________________________________ Date: ________________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Industrial Food Chemistry

4024781-2
Course Specifications
(CS)

Course Specifications

Institution : **Umm al Qura University** Date of Report : **2017**

College/Department : **College of Applied Sciences / Department of Chemistry**

A. Course Identification and General Information

1. Course title and code: **Industrial Food Chemistry 4024781-2**
2. Credit hours : **2 hrs (2 theoretical)**
3. Program(s) in which the course is offered.
(If general elective available in many programs indicate this rather than list programs)
Industrial Chemistry
4. Name of faculty member responsible for the course: **Dr. Nizar El Guesmi**
5. Level/year at which this course is offered : **eighth Level / fourth Year**
6. Pre-requisites for this course (if any) : **Organic Spectroscopy**
7. Co-requisites for this course (if any)
8. Location if not on main campus: **El-Abdyah**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ☒ What percentage? 100%

b. Blended (traditional and online) What percentage?

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage? ☐

Comments:

B Objectives

1. What is the main purpose for this course? **Definition of the natural properties of the components of a food, their function and importance, reactions and methods of manufacturing, warehousing and distribution operations.**
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) **The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course**

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Introduction to the food industry	**1**	**2**
Raw materials in the food industry	**1**	**2**
Preservatives and additives	**1**	**2**
Flavorings and antioxidants	**2**	**4**
Fermentation and its impact on the food industry	**1**	**2**
Food contaminants and the impact of pesticides on food	**1**	**2**
Important chemical reactions in food	**2**	**4**
Examples of some food industry: Margarine industry ; Fruit and vegetable juice; Industrial drinks; Jams and jellies and similar products; Tomatoes and products.	**4**	**8**
The impact of manufacturing, warehousing and distribution operations on natural components for food.	**1**	**2**

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	**28**	-	-	-	-	**28**
Credit	**2**	-	-	-	-	**2**

3. Additional private study/learning hours expected for students per week. . ~ **4 Hours**

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	**Course Teaching Strategies**	**Course Assessment Methods**
1.0	**Knowledge**		
1.1	Recognize the raw materials in the food industry	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • long and short essays • posters lab manuals
1.2	Know the fermentation operation and its impact on the food industry		
1.3	Describe the different methods of manufacturing of some food industry		
1.4	Familiar with the general steps of manufacturing of different food industry		
1.5	Select the proper preservatives, additives, flavorings and antioxidants used in food industry		
1.6	Identify the food contaminants		
1.7	Write a important chemical reactions in food		
1.8	Recognize the importance of warehousing and distribution operations on natural components for food		
1.9	Outline the different uses of food industry		
2.0	**Cognitive Skills**		
2.1	Compare each class of food industry through its raw materials.	• Lectures • Scientific discussion • Library visits	• Exams • web-based student performance systems
2.2	Explain the Fermentation operation and its impact on the food industry		

2.3	Analyze the specific operations for manufacturing, warehousing and distribution and its impact on natural components for food.	• Web-based study	• portfolios • posters • demonstrations
2.4	Predict the benefits and harms of some food industry		
2.5	Summarize the different methods for the preparation of some food industry		
3.0	**Interpersonal Skills & Responsibility**		
	• NOT APPLICABLE	•	•
4.0	**Communication, Information Technology, Numerical**		
	• Evaluate the different methods of preparation of food industry • Demonstrate a synthetic pathways for manufacturing of some food industry • Use information and communication technology. • The ability to use e-mail to communicate with the instructor and other students. • Scientific writing. • Use his/her observations to solve problems.	• Lectures • Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
5.0	**Psychomotor**		
5.1	NOT APPLICABLE		
5.2			

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	First Periodic Exam.	6	20 %
3	Second Periodic Exam.	12	20 %
4	Final Exam. (2hours exam)	16	50 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours : During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

1. H. D. Belitz , W. Grosch, P. Schieberle "*Food Chemistry*" **2009**, Springer.
2. O. R. Fennema "*Food Chemistry (Food Science and Technology) 4th Edition*" **2007**, CRC Press.
3. Roy Teranishi, Emily L. Wick, Irwin Hornstein "*Flavor Chemistry: Thirty Years of Progress, 1st Edition*" **1999**, Springer
4. Stig Friberg, Kare Larsson, Johan Sjoblom "Food *Emulsions (Food Science and Technology) 4th Edition*" **2003**, CRC Press

2. List Essential References Materials (Journals, Reports, etc.)

- **Food Science & Nutrition**
- **Comprehensive Reviews in Food Science and Food Safety**

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

5. Y. Velisek. " *The Chemistry of Food* " **2014**, Wiley-Blackwell.
6. Titus A. M. Msagati. **"** *The Chemistry of Food Additives and Preservatives*" **2012,** Wiley-Blackwell**.**

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com**
- **http://www.sciencedirect.com**
- **http://www.rsc.org**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- **Classrooms capacity (30) students.**
- **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.) ▪ **Room equipped with computer and projector and TV.**
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) • **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching **Complete the questionnaire evaluation of the course in particular.**
2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor • **Observations and the assistance of colleagues.** • **Independent evaluation for extent to achieve students the standards.** • **Independent advice of the duties and tasks.**
3 Processes for Improvement of Teaching • **Workshops for teaching methods.** • **Continuous training of member staff.** • **Review of strategies proposed.** • **Providing new tools for learning.** • **The application of e-learning.** • **Exchange of experiences internal and external.**
4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) ▪ **Check marking of a sample of exam papers, or student work.** ▪ **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff : **Dr/ Nizar ElGuesmi**

Signature: **Date Report Completed: 2017**

Received by: Dr. Ismail Althagafi **Department Head**

Signature: ________________________________ Date: _______________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Medicinal Chemistry

4024785-2

Course Specifications
(CS)

Course Specifications

Institution: **Umm Al-qura University**	Date of Report: **2015**
College/Department : **Faculty of Applied Science/ department of chemistry**	

A. Course Identification and General Information

1. Course title and code: **Medicinal Chemistry/ 4024785-2**
2. Credit hours: **2 (theoretical)**
3. Program(s) in which the course is offered. **Industrial Chemistry**
4. Name of faculty member responsible for the course: **Dr. Essam M. Hussein**
5. Level/year at which this course is offered: **8st level / 4th year**
6. Pre-requisites for this course (if any): **heterocyclic Chemistry**
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **El-Abdyah**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ■ What percentage? **100%**

b**. Blended (traditional and online)** What percentage?

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage? ☐

Comments:

B Objectives

1. What is the main purpose for this course?

The course is designed to know the principles of medicinal chemistry and studying of some organic compounds used in the treatment of various diseases and the study of the structure-activity and quantitative structure-activity relationships.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
a. **General Principles of Drug Action**	1	2
b. **Defense of the body against bacterial invasion - Microorganisms which cause diseases**	1	2
c. **Chemotherapy of bacterial diseases and bacterial infections - Structure-activity relationship (SARs) and Quantitative structure–activity relationships (QSARs)**	1	2
d. **Sulfa drugs (types – synthesis - clinical uses – mode of action)**	2	4
e. **Antibiotics (Penicillin – synthesis of Penicillin derivatives – Penicillin G – Penicillin V – Amoxicillin - synthesis of Ampicillin from Penicillin G – characteristics of Penicillin –Streptomycin chemistry – Tetracycline antibiotics – Chloramphenicol – synthesis of Chloramphenicol – properties of Chloramphenicol)**	2	4
f. **Vitamins (importance – Vitamin B_1 –properties of Vitamin B_1 –Deficiency and sources of Vitamin B_1 – Vitamin B_2 – properties of Vitamin B_2 – vitamin B_6 - synthesis of Vitamin B_6)**	1	4
g. **Histamine (definition - antihistamines)**	2	4
h. **Peptic ulcer diseases (causes – antiulcer medications)**	1	2
i. **Central nerve system drugs – Treatment of Alzheimer disease**	2	4
j. **Anticancer agents**	1	2

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	-		0		28
Credit	2	-		0		2

3. Additional private study/learning hours expected for students per week. ☐

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Familiar with the importance of chemistry in medical field	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • long and short essays • posters lab manuals
1.2	Identify the different classes of chemotherapeutic agents		
1.3	Recognize the different methods used in the preparation of various chemotherapeutic agents		
1.4	Know the basic principles of drug action		
1.5	Determine the structure-activity relationships (SARs and QSARs)		
1.6	Familiar with the basic knowledge about the properties and importance of various chemotherapeutic agents		
1.7			
2.0	**Cognitive Skills**		
2.1	Explain the structure-activity relationships	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • posters • demonstrations
2.2	Compare between the action of different chemotherapeutic agents		
2.3	Explain the mode of action of different chemotherapeutic agents		
2.4	Summarize the different methods used to synthesis of various chemotherapeutic agents		
2.5			
3.0	**Interpersonal Skills & Responsibility**		

		•	•
3.3			
4.0	**Communication, Information Technology, Numerical**		
	• Evaluate the different methods to synthesis of various chemotherapeutic agents • Demonstrate a clinical uses of various chemotherapeutic agents • Use the internet as a means of communication and a source of information. • Encourage students to use internet for searching certain electronic journals regarding topics of the course. • Scientific writing.	• Lectures • Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
5.0	**Psychomotor**		
5.1	NOT APPLICABLE		
5.2			

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	First Periodic Exam.	6	20 %
3	Second Periodic Exam.	12	20 %
4	Final Exam. (2hours exam)	16	50 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**

- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

- John M. Beale, Jr. and John H. Block ”*Textbook of Organic Medicinal and Pharmaceutical Chemistry*” 11th Edition-Lippincott Williams & Wilkins **2004**.

- Graham L. Patrick "*An Introduction to Medicinal Chemistry*” OXFORD UNIVERSITY PRESS **1995**.

2. List Essential References Materials (Journals, Reports, etc.)

- Lecture Hand outs available on the coordinator website

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

1. Thomas L. Lemke, David A. Williams, Victoria F. Roche, S. William Zito "*Foye's Principles of Medicinal Chemistry, 7th Edition* " Lippincott Williams & Wilkins **2012**.

-

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com**
- **http://www.sciencedirect.com**
- **http://www.rsc.org**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- **Classrooms capacity (30) students.**
- **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

- **Room equipped with computer and projector and TV.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

Complete the questionnaire evaluation of the course in particular.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- **Observations and the assistance of colleagues.**
- **Independent evaluation for extent to achieve students the standards.**
- **Iindependent advice of the duties and tasks.**

3 Processes for Improvement of Teaching

- **Workshops for teaching methods.**
- **Continuous training of member staff.**
- **Review of strategies proposed.**
- **Providing new tools for learning**.
- **The application of e-learning.**
- **Eexchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: Dr. Essam M. Hussein

Signature: **Date Report Completed: 2015**

Received by: Dr. Ismail Althagafi Department Head

Signature: ________________________________ Date: _______________

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

COURSE SPECIFICATION

Petrochemicals Industries

4024776-2

Revised March 2016

Course Specification

For Guidance on the completion of this template, please refer to of Handbook 2 Internal Quality Assurance Arrangements

Institution Umm Al-Qura University
College/Department Applied Sciences /Chemistry Department

A Course Identification and General Information

Course title and code: **Petrochemicals Industries, 4024776-2**
Credit hours: 2 hrs **(theoretical)**
3. Program(s) in which the course is offered. **(If general elective available in many programs indicate this rather than list programs)** **Industrial Chemistry**
4. Name of faculty member responsible for the course **Dr. Refaat Alsayed**
5. Level/year at which this course is offered : **7th / 4th semester (1436-1437)**
6. Pre-requisites for this course (if any) **Petroleum Chemistry**
7. Co-requisites for this course (if any)
8. Location if not on main campus: El-Abdyah

B Objectives

1. Summary of the main learning outcomes for students enrolled in the course. **Theoretical Study of petrochemical Technology and petroleum industries based on the petroleum products.**
2. Briefly describe any plans for developing and improving the course that are being implemented. (eg increased use of IT or web based reference material, changes in content as a result of new research in the field). **The use of smart teaching halls for lectures. Encouraging students to do reports as a self-education for natural gas and it use, Methane hydrate and alternative fuels whether using the library or the Internet.**

C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached)

1 Topics to be Covered

Topic	No of Weeks	Contac thours
Introduction of petrochemical industries	**1**	**2**
Raw materials for the petrochemical industry	**2**	**4**
Fundamental processes of petrochemical industry	**1**	**2**
Ethylene production of thermal cracking	**1**	**2**
Petrochemical production of ethylene	**1**	**2**
Petrochemical production of propylene	**2**	**4**
Petrochemical butenes and butadienes	**1**	**2**
The production of benzene, toluene and xylene	**1**	**2**
The steam reforming process and its industrial uses	**1**	**2**
Fischer-Tropsch process	**1**	**2**
Other Petroleum industries technology	**2**	**4**

2 Course components (total contact hours per semester):

Lecture:	Tutorial:	Practical/Fieldwork/Internship:	Other:
28	**-**	**-**	

3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week)

Almost two hours per week spent by students to prepare reports, discuss and resolve questions, addition to the hours of theoretical lecture basic process.

4. Development of Learning Outcomes in Domains of Learning
For each of the domains of learning shown below indicate:
A brief summary of the knowledge or skill the course is intended to develop;
A description of the teaching strategies to be used in the course to develop that knowledge or skill;
The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

a. Knowledge

(i) Description of the knowledge to be acquired

- **Know the date of the beginning of the petrochemical industries**
- **Know the importance of petrochemical industries**
- **Knowledge of raw materials for the petrochemical industry**
- **Learn methods of converting raw materials to final products, industrial**
- **Know the different techniques Petrochemical Industries**

(ii) Teaching strategies to be used to develop that knowledge
Scientific discussions and work in small groups.
Use the library to do some research.
Use of the Internet to do some public reports.

(iii) Methods of assessment of knowledge acquired
The final written examinations and mid-semester.
Oral exams.
Discussions.
Systematic research on the relevant subjects.

b. Cognitive Skills

(i) Cognitive skills to be developed
The student acquires the skill of thinking in trying to find the relation between the crude oil products and its use in industry and the development in our lifestyle.
Knowledge of the formulation of the chemical compositions of industrial petrochemical products.
Methods of chemical transformation of crude oil products to petrochemical industrial material.
Think of trying to find the best and green ways to get on petrochemical products.

(ii) Teaching strategies to be used to develop these cognitive skills
Using brain storming at the beginning of each lecture in order to stimulate the students towards the new topic of the course.
Enhancing open discussion during the lecture.

(iii) Methods of assessment of students cognitive skills
Through assignments and homework.

c. Interpersonal Skills and Responsibility

(i) Description of the interpersonal skills and capacity to carry responsibility to be developed

Take the personality and responsibility for their own learning
Working effectively in groups and exercise leadership when appropriate
Act ethically and consistently with high molar standards in personal and public forms.
Community linked thinking

(ii) Teaching strategies to be used to develop these skills and abilities

Using the computer lab.
Visit the Central Library.
Visit research centres.
The use of international information network.

(iii) Methods of assessment of students interpersonal skills and capacity to carry responsibility

Put in the test questions explanation of the simple. Statistical information.
Evaluation of the duties associated with the proper use of communication skills and numerical mathematical skills.
The allocation of part of the grades to assess the level of use of ICT in the presentation.

d. Communication, Information Technology and Numerical Skills

(i) Description of the skills to be developed in this domain.

Use IT and communication technology in gathering and interpreting information and ideas.

(ii) Teaching strategies to be used to develop these skills

Lectures
Scientific discussion
Library visits
Web-based study

(iii) Methods of assessment of students numerical and communication skills

web-based student performance systems
individual and group presentations

e. Psychomotor Skills (if applicable)

(i) Description of the psychomotor skills to be developed and the level of performance required

- Not a requirement for this decision.

(ii) Teaching strategies to be used to develop these skills

- Not a requirement for this decision.

(iii) Methods of assessment of students psychomotor skills

- Not a requirement for this decision.

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	First Periodic Exam.	6	20 %
3	Second Periodic Exam.	12	20 %
4	Final Exam. (2hours exam)	16	50 %
5	**Total**	**100 %**	

D. Student Support

1. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)

Presence of faculty members to provide counseling and means.
Office Hours: weekly during working hours, and to create appropriate means
Academic Advising for students to those who need it.

E Learning Resources

1. Required Text(s)
Petroleum and petrochemical course presented by the lecturer.

2. Essential References

U. R. Chaudhuri, Fundamentals of Petroleum and Petrochemical Engineering, CRC Press, 2010, P. 411, ISBN 9781439851609.
S. Matar, L. F. Hatch, Chemistry of Petrochemical Processes, 2nd ed. 2001, P. 392, ISBN 9780884153153.
D. S. J. Jones, Elements of Petroleum Processing, 1996, John Wiley & Sons.
P. Wiseman, Petrochemicals, Ellis Horwood Limited 1986.

I.D. Mall. Petrochemical Process Technology Paperback – 1 Sep 2017
Laxmi Publications Private Limited; Second edition (1 September 2017)

Lisa Kaaki. New book documents history of GCC petrochemical industry
Wednesday 16 March 2016

3- Recommended Books and Reference Material (Journals, Reports, etc) (Attach List)
International petroleum encyclopedia, Tulsa, Oklahoma: Pennwell, Corporation, 2007.

4-.Electronic Materials, Web Sites etc

https://en.wikipedia.org/wiki/Petrochemical
http://www.chemhelper.com/
http://www.chemweb.com/
http://www.sciencedirect.com/

5- Other learning material such as computer-based programs/CD, professional standards/regulations

Microsoft Power Point, Microsoft Word.
Video show on thermodynamics.
Learning CD on thermodynamics.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in **classrooms and laboratories, extent of computer access etc.)**

1. Accommodation (Lecture rooms, laboratories, etc.)

Classroom capacity (30) students.
Processing of the classroom with appropriate educational means, including computers

2. Computing resources

Classroom is equipped with a computer, Data Show and TV.

3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

There is no other requirement

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching

Complete the questionnaire assessment due in particular.
Focus group discussions with small groups of students.

2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department

Observations and the assistance of colleagues.
Independent evaluation of the extent to which students of the standards.
Independent advice to the duties and tasks.

3 Processes for Improvement of Teaching

Workshops to teaching methods.
Ongoing training of faculty member.
Review the proposed strategies.

Providing modern tools necessary for learning.
Application of the means of e-learning.
The exchange of internal and external expertise

4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)

Examination of a sample of the patch test papers, or student work by an independent faculty member.
Periodic exchange and remarking of a sample of assignments or tests with a faculty member to last the same decision in other educational institution.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

Consultation among professors .
Host a visiting professor to evaluate the course.
Workshops for teachers of the course.
Periodic review of the contents of the course and amend the negatives.

Faculty or Teaching Staff: **Dr. Refaat Alsayed**

Signature: **Date Report Completed: 2015**

Received by: Dr. Ismail Althagafi **Department Head**

Signature: ______________________________ **Date:** ______________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Chemistry of Cosmetics

4024772-1

Course Specifications
(CS)

Course Specifications

Institution: **Umm Al-qura University** Date of Report: **2016**

College/Department : **Faculty of Applied Science/ department of chemistry**

A. Course Identification and General Information

1. Course title and code: **Chemistry of cosmetics/ 4024772-1**
2. Credit hours: **1 (theoretical)**
3. Program(s) in which the course is offered. **Industrial Chemistry**
4. Name of faculty member responsible for the course: **Professor Mohamed Rabie**
5. Level/year at which this course is offered: **7th level/4th year**
6. Pre-requisites for this course (if any): **Physical Organic Chemistry**
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **El-Abedyah**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ☒ What percentage? **100%**

b**. Blended (traditional and online)** What percentage?

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage? ☐

Comments:

B Objectives

1. What is the main purpose for this course? **By the end of this course student will be familiar with chemistry, types and manufacture of cosmetics**
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) **The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course**

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Introduction to cosmetics and toiletry compounds	1	1
Alcohols used in cosmetics and toiletry compounds and their sources	1	1
Aldehydes and ketones used in flavors and fragrances	1	1
Carboxylic acids and esters in essential oils	1	1
Waxes used in cosmetics and toiletry compounds	1	1
Surface active agents: types and its importance in cosmetics manufacture	1	1
Hair care agents: their structures and types	1	1
Skin care agents: their chemical structures and types	1	1
Dyes used in cosmetics: chemical structure	1	1
Some cosmetic formulations	2	2
Applications	1	1

II-General scheme for identification of organic aliphatic unknown

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	14	-		-		14
Credit	1	-		-		1

3. Additional private study/learning hours expected for students per week. 1hr

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Recognize the basis and general types of compounds used in cosmetics manufacture	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • long and short essays • posters lab manuals
1.2	Identify the different types of essential oils		
1.3	Know the types and classifications of alcohols used in cosmetics		
1.4	Familiar with different aldehydes and ketones used in flavors and fragrances		
1.5	Familiar with the Esters ad acids used in in flavors and fragrances manufacture		
1.6	Identify the structure of different waxes used in manufacture		
1.7	Identify the different types of surfactants used in cosmetics		
1.8	Outline the different types of hair and skin care agents		
2.0	**Cognitive Skills**		
2.1	Compare between structure of different compounds used in cosmetics manufacture		
2.2	Explain the different strategies for preparation flavors and fragrances		
2.3	Analyze the roles of surfactants in cosmetic industry		
2.4	Predict the most suitable formulations for hair and skin care		
3.0	**Interpersonal Skills & Responsibility**		
	• Ability to work in a team to perform a specific task.	• Sci entific discussion • W eb-based study	• web-based student performance systems
4.0	**Communication, Information Technology, Numerical**		

	• Evaluate the different methods of preparation cosmetics • Demonstrate a synthetic pathways for flavors and fragrances • Enhancing the ability of students to use computers and internet. • Interpret chemical data • Present chemical data orally. • Know how to write a report.	• Lectures • Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
5.0	**Psychomotor**		
5.1	NOT APPLICABLE		
5.2			

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	First Periodic Exam.	6	20 %
3	Second Periodic Exam.	12	20 %
4	Final Exam. (2hours exam)	16	50 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

Handbook of Cosmetic Science and Technology, 3rd edition Andr é O. Barel, Marc Paye and Howard I. Maibach, 2009

2. List Essential References Materials (Journals, Reports, etc.)

- Lecture Hand outs available on the coordinator website

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com**
- **http://www.sciencedirect.com**
- **http://www.rsc.org**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- **Classrooms capacity (30) students.**
- **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

- **Room equipped with computer and projector and TV.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching
Complete the questionnaire evaluation of the course in particular.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- **Observations and the assistance of colleagues.**
- **Independent evaluation for extent to achieve students the standards.**
- **Iindependent advice of the duties and tasks.**

3 Processes for Improvement of Teaching

- **Workshops for teaching methods.**
- **Continuous training of member staff.**
- **Review of strategies proposed.**
- **Providing new tools for learning.**

- **The application of e-learning.**
- **Eexchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: **Professor Mohamed R. Shaaban**

Signature: **Date Report Completed: 2016**

Received by: Dr. Ismail Althagafi **Department Head**

Signature: ________________________________ **Date:** _______________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Chemistry of detergents and pesticides

4024782-2

Course Specifications
(CS)

Course Specifications

Institution: **Umm Al-Qura University** Date of Report: **2016**

College/Department : **Faculty of Applied Science/ Department of Chemistry**

A. Course Identification and General Information

1. Course title and code: **Chemistry of detergents and pesticides/ 4024782-2**
2. Credit hours: **2 hrs (theoretical)**
3. Program(s) in which the course is offered: **Industrial Chemistry**
4. Name of faculty member responsible for the course: **Dr. Refaat Alsayed**
5. Level/year at which this course is offered: **8th level/4 year (2nd term)**
6. Pre-requisites for this course (if any): **heterocyclic Chemistry**
7. Co-requisites for this course (if any): **--------------**
8. Location if not on main campus: **El-Abdyah**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ☒ What percentage? **100%**

b**. Blended (traditional and online)** What percentage?

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage? ☐

Comments:

B Objectives

1. What is the main purpose for this course?

By the end of this course student will be familiar with Studying of detergents, pesticides and definition of different types of them

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
a- Introduction to Industrial Chemistry, Oils and Fats	1	2
b- Identification of the different types of detergents and methods of the preparation	2	4
c- Soaps and products – saponification – the preparation of the final products of soap (soap molds – fabrics or tissue washing powders)	2	4
d- Tissue products (candida – enzymes – foam)	2	4
e- Identification of the different types for natural and industrial pesticides with their names: pesticides, weeds and fungi	3	4
f- Chemicals, which uses in insects, plants and microorganisms	2	4
g- Recognize of the risks for using the pesticides	2	4

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	-		-		28
Credit	2	-		-		2

3. Additional private study/learning hours expected for students per week. ☐

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Studying the definition and properties of detergents and pesticides	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • long and short essays
1.2	Describing the classification of surface active agents		
1.3	Knowledge of different types of detergents and their uses		
1.4	Showing the multiple methods of preparation of detergents		
1.5	Recognizing the chemical properties and uses of pesticides		
1.6	Identifying the chemicals which uses in insects, plants and microorganism		
2.0	**Cognitive Skills**		
2.1	Development of reverse thinking skill (back thinking) and the student's acquiring the training skill to choose the suitable method for detergents preparation	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • posters • demonstration
2.2	Making the student acquire the skill of naming detergents and pesticides		
2.3	The student's acquiring of the skill of how to predict the outcomes of interactions of organic compounds by light		
2.4	The student can pick the appropriate methods for the		

	preparation of different soap molds, tissue washing		s
2.5	Design of different ways to synthesize several types of detergents		
2.6	Student invents different ideas for the construction of many of the different organic compounds with interested effect		
2.7	The student is planning to make a research program in the field of advanced organic chemistry and their effectiveness		
3.0	**Interpersonal Skills & Responsibility**		
	• Present chemical data orally. • Know how to write a report. • Self-reliance and take individual responsibility and the ability to work within the group	* Scientific discussion * Web-based study	• web-based student performance systems
4.0	**Communication, Information Technology, Numerical**		
	• The ability to conduct a successful style of dealing with data analysis, describing his strategy in the image and draw conclusions from them • use the computer and the internet to search for sources of new researches and collect the researches which help in writing reports on topics related to syllabus	• Lectures • Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
5.0	**Psychomotor**		
5.1	NOT APPLICABLE		
5.2			

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	First Periodic Exam.	6	20 %
3	Second Periodic Exam.	12	20 %
4	Final Exam. (2hours exam)	16	50 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

- P. K. Chattopadhyay. Modern Technology of Soaps, Detergents & Toiletries (with Formulae & Project Profiles) 3rd Edition. Niir Project, (2015).
- K.L. Heong, K.H. Tan, C.P.F. Garcia, L.T. Fabellar, and Z. Lu. Research Methods in Toxicology and Insecticide Resistance Monitoring of Rice Planthoppers. Copyright International Rice Research Institute (2011).

2. List Essential References Materials (Journals, Reports, etc.)

- Lecture Hand outs available on the coordinator website

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

- "Everyday Chemistry – Why Oil and Water do not mix?." Everyday Chemistry – Why Oil and Water do not mix?. N.p., n.d. Web. 16 Aug. 2014. http://human touch of chemistry.com/why-oil-and-water-do-not-mix.htm
- A Osorio, M.D. Insecticides, Rodenticides & Herbicides. USF Emergency Medicine Residen PGY II April 10th (2009).
- A A Ahamed. Public health hazard of antibiotic and insecticide treatments of livestock .Review article , submitted to continual . Scientific committee of hygiene , Nutrition , Animal husbandry and food control (2004).
- Niir Board of Consultants & Engineers. The complete technology book on detergents (2nd revised edition 2013) ISBN: 978-93-81039-19-9

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com**
- **http://www.sciencedirect.com**
- **http://www.rsc.org**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)
   - **Classrooms capacity (30) students.**
   - **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

   - **Room equipped with computer and projector and TV.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)
   - **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching
Complete the questionnaire evaluation of the course in particular.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor
- **Observations and the assistance of colleagues.**
- **Independent evaluation for extent to achieve students the standards.**
- **Iindependent advice of the duties and tasks.**

3 Processes for Improvement of Teaching
- **Workshops for teaching methods.**
- **Continuous training of member staff.**
- **Review of strategies proposed.**
- **Providing new tools for learning.**
- **The application of e-learning.**
- **Eexchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: Dr Refat El-Sayed

Signature: **Date Report Completed: 2016**

Received by: Dr. Ismail Althagafi **Department Head**

Signature: ________________________________ Date: _______________

Kingdom of Saudi Arabia
National Commission for
Academic Accreditation & Assessment

المملكة العربية السعودية
الهيئة الوطنية للتقويم
والاعتماد الأكاديمي

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Dyes and fibers

4024771-3
Course Specifications
(CS)

Course Specifications

Institution: **Umm Al-qura University** Date of Report: **2016**

College/Department : **Faculty of Applied Science/ department of chemistry**

A. Course Identification and General Information

1. Course title and code: **Dyes and fibers/ 4024771-3**
2. Credit hours: **3 hrs (2 theoretical + 1 practical)**
3. Program(s) in which the course is offered. **Industrial Chemistry**
4. Name of faculty member responsible for the course: **Professor Dr. Thoraya A. Farghaly**
5. Level/year at which this course is offered: **7rd level/4st year**
6. Pre-requisites for this course (if any): **Physical organic chemistry and steriochemistry**
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **El-Abdyah**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ■ What percentage? **100%**

b**. Blended (traditional and online)** What percentage?

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage? ☐

Comments:

B Objectives

1. What is the main purpose for this course? **By the end of this course student will be familiar with nomenclature, chemical properties and synthesis of dyes and know the types of fibers and how they can dye the textile fibers.**
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) **The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course**

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
• Colors theory, the relation between the color and the structure of the dyes and the visual and ultraviolet Spectra	1	2
• Classification of dyes: Classification based on chemical structure, Classification based on application method (natural dyes, synthetic dyes), Dyes Containing Anionic Functional Groups,	1	2
• Dyes Containing Cationic Groups (Basic Dyes), Dyes Requiring Chemical Reaction Before Application	2	4
• Structure of synthetic dyes (nitro, nitrozo, azo, triarylmethane, xanthan, acridine, qiunoline and others) and their synthesis.	2	4
• Application Methods and Factors Affecting Dyeing	2	4
• Introduction on fibers and their types : natural fibers (animal fibers (wool, silk, leathers, hair), plant fibers (cotton, rubber)	2	4
• synthetic fibers (Rayon, Cellulose acetate, Nylon, polyester, acrylic and polyolefins	2	4
• Uses of fibers	1	2
• Kinds of forces that bind the dye fiber	1	2

laboratory Part:

1- **Synthesis of sudan dye {Phenyl azo *β*-naphthol}**
2- **Synthesis of methyl Orange**
3- **Synthesis of orange (II)**
4- **Synthesis of mono azo disperse dye.**
5- **Synthesis of heterocyclic disperse dye.**
6- **Desizing, Scouring and Bleaching of raw cotton fabric**
7- **Dyeing of cotton fiber and silk**

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	-	42			70
Credit	2	-	1			3

3. Additional private study/learning hours expected for students per week. 2hrs

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	**Course Teaching Strategies**	**Course Assessment Methods**
1.0	**Knowledge**		
1.1	Recognize the nomenclature of different dyes	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • long and short essays • posters lab manuals
1.2	Know the classifications all types of dyes and fibers		
1.3	Remember the physical properties of dyes		
1.4	Describe the different methods of preparations of dyes and fibers		
1.5	Familiar with Kinds of forces that bind the dye fiber		
1.6	Define the preparation methods of some organic pigments such as azo dyes		
1.7	Recognize the industrial use of most famous dyes and fibers		
1.8	Know the different types of fibers.		
2.0	**Cognitive Skills**		
2.1	Making the student acquire the skill of naming azo dyes	• Lectures • Scientific	• Exams • web-based
2.2	Apply preparation methods of some organic pigments such as azo		

	dyes	discussion • Library visits • Web-based study	student performance systems • portfolios • posters • demonstrations
2.3	The distinction between different types of organic pigments		
2.4	Summarizes the most important Kinds of forces that bind the dye fiber		
2.5	Design of different ways to synthesize several types of dyes		
2.6	Doing a process dye on cotton fiber and silk		
3.0	**Interpersonal Skills & Responsibility**		
	• The division of students collectively for teams to make some common reports • Self-reliance and take individual responsibility and the ability to work within the group • Ability to work independently to handle Chemicals and perform laboratory illustrations safely. • Ability to communicate results of work to classmates. • Ability to work in a team to perform a specific task.	• Class discussions • Research activities	• Performance on in-practical exams. • Work on research activity. • Overall student performance in Lab. discussions • Cross questions after finishing laboratory work
4.0	**Communication, Information Technology, Numerical**		
	• Evaluate the different methods of preparation of different types of dyes and pigments • Ability to computers and internet to search and restore information. • Use information and communication technology. • The ability to use e-mail to communicate with the instructor and other students. • Scientific writing.	• Lectures • Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
5.0	**Psychomotor**		
5.1 5.2	Laboratory practice . including 1.Locate Materials Safety Data Sheets, chemicals carcinogens list, and hazardous chemicals list. 2. Handle chemicals safely with a proper PPE 3..Dispose the hazardous solution in right way	Practical session should include both demonstration and experiments .	1.Repetition of the experiments , to reproduce the results 2.Written report of chart and

			procedures. 3.The students should be able to correlate their results with experimental conditions

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	Midterm Exam.	8	20 %
3	Practical Exam.	14	30 %
4	Final Exam. (2hours exam)	16	40 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **We have faculty members to provide counseling and advice.**
- **Office hours: During the working hours weekly.**
- **Academic Advising for students.**

E. Learning Resources

1. List Required Textbooks

- Industrial Dyes: Chemistry, Properties, Applications by Klaus Hunger- WILEY-VCH Verlag GmbH & Co. 2. 2004
- Physico-chemical principles of color chemistry, A. T. Peters, H. S. Freeman, 1996
- Colorants for Non – Textile Applications by Freeman - Elseiver, 2000.

2. List Essential References Materials (Journals, Reports, etc.)

- Lecture Hand outs available on the coordinator website

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

- Modern Colorants: Synthesis and Structure by A T Peters and H S Freeman - Springer, 1995

- Color Chemistry: Syntheses, Properties, and Applications of Organic Dyes and pigments, Heinrich Zollinger, **2003**.

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com**
- **http://www.sciencedirect.com**
- **http://www.rsc.org**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- **Classrooms capacity (30) students.**
- **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

- **Room equipped with computer and projector and TV.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching
Complete the questionnaire evaluation of the course in particular.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- **Observations and the assistance of colleagues.**
- **Independent evaluation for extent to achieve students the standards.**
- **Iindependent advice of the duties and tasks.**

3 Processes for Improvement of Teaching

- **Workshops for teaching methods.**
- **Continuous training of member staff.**
- **Review of strategies proposed.**
- **Providing new tools for learning.**
- **The application of e-learning.**

- **Eexchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: **Professor Dr. Thoraya A. Farghaly**

Signature: Thoraya A. Farghaly **Date Report Completed: 2015**

Received by: Dr. Ismail Althagafi **Department Head**

Signature: ________________________________ **Date:** _______________

B- Inorganic Chemistry Courses

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

General Chemistry 2

4022131-2

Course Specifications

(CS)

1436/1437 H

2015/2016 AD

Course Specifications

Institution: **Umm Al-Qura University** Date of Report: **2015**

College/Department : **Faculty of Applied Sciences / Chemistry Department**

A. Course Identification and General Information

1. Course title and code: **General Chemistry 2/ 4022131-2**
2. Credit hours: 2 **(theoretical)**
3. Program(s) in which the course is offered: **Chemistry**
4. Name of faculty member responsible for the course: **Dr. Mona Alhasani**
5. Level/year at which this course is offered: **3rd level/2nd year**
6. Pre-requisites for this course (if any): **-** General Chemistry 1
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **both on El-Abedyah and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ☒ What percentage? **100%**

b**. Blended (traditional and online)** What percentage?

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage? ☐

Comments:

B. Objectives

1. What is the main purpose for this course?

By finishing of this course, the students will be able to discuss and explain:

a. The atomic shells, their shapes and Bohr theory of hydrogen atom.

b. Electronic structure and Lewis structures of different chemical compounds.

c. The valence shell electron pairs repulsion theory, molecular orbital theory and valence bond theory.

d. The principle quantum numbers, classification of elements and properties of ionic and covalent compounds.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

- Using different learning sources of the course, so that the students make use of more than one reference.
- The use of smart teaching halls for lectures.
- Encourage students to carry out reports in the field of general chemistry.

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached):

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
• Electronic structure – atomic shells and their shapes.	**1**	**2**
• Bohr theory of hydrogen atom.	**1**	**2**
• Principle quantum numbers.	**1**	**2**
• Properties of elements and the periodic table – classification of elements into periods and groups.	**1**	**2**

• Comparison between some properties of the elements inside the period such as; ionization energy, electron affinity, electronegativity and atomic size.	**2**	**4**
• Chemical bonds; their types and theories – Lewis symbols and structures.	**1**	**2**
• Valence shell electron pairs repulsion theory.	**1**	**2**
• Valence bond theory.	**1**	**2**
• Hybridization and its types	**2**	**4**
• Molecular orbital theory – octet rule.	**2**	**4**
• Properties of ionic and covalent compounds.	**1**	**2**

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	-		-		28
Credit	2	-		-		2

3. Additional private study/learning hours expected for students per week.

- Student spends 10 hrs in preparing reports related to general chemistry and their discussions.

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	**Course Teaching Strategies**	**Course Assessment Methods**
1.0	**Knowledge**		
1.1	Describe the atomic shells and their shapes.	• Lectures	• Written mid-term and

1.2	Write on classification of elements into periods and groups.	• Scientific discussion • Use the library to work duties and a small research on general chemistry. • Use of the Internet to carry out some reports on course subjects.	final exams • Long and short essays.
1.3	List the properties of the elements inside the periods and groups.		
1.4	Memorize the valence shell electron pairs repulsion theory.		
1.5	Describe Bohr theory of hydrogen atom.		
2.0	**Cognitive Skills**		
2.1	Predict the type of hybridization in a chemical compounds.	• Lectures • Scientific discussion • Library visits • Web-based study	• Periodic tests and assignments. • Measuring the response to the assignments.
2.2	Explain Lewis structures of different chemical compounds.		
2.3	Compare between molecular orbital theory and valence bond theory.		
2.4	Estimate the principle quantum numbers of different chemical compounds.		
3.0	**Interpersonal Skills & Responsibility**		
3.1		• Dividing students into groups to carry out collective scientific reports. • Periodic	• Evaluate the results of collective works and duties as well as knowing the contribution of each individual through
3.2	Develop the student's ability in self-reliance and responsibility.		
3.3	Operate in team work and accept his college's opinions.		

		individual duties to develop the skill of taking responsibility and self-reliance	dialogue and discussion. • Assessment of individual tasks and duties to determine the student's ability to self-reliance.
4.0	**Communication, Information Technology, Numerical**		
4.1	Use computers and the international information network (the Internet) to perform calculations and to identify recent research relevant to decision sources.	• Visiting research centers. • The use of computers in the training room of the department. • Using the internet for collecting data.	• Evaluation of the duties associated with the proper use of numerical and communication skills. • Web-based student performance systems • Individual and group presentations.
4.2	Perform mathematical calculations and data analysis.		
5.0	**Psychomotor**		
5.1	• Not applicable.		
5.2			

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	First Periodic Exam.	6	20 %
3	Second Periodic Exam.	12	20 %
4	Final Exam.	16	50 %

5	**Total**	**100 %**

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- Office hours: During the working hours weekly.
- Academic Advising for students.
- Availability of Staff members to provide counseling and advice.

E. Learning Resources

1. List Required Textbooks

- General Chemistry: The Essential Concepts 7th Edition by Raymond Chang Dr., Kenneth Goldsby Professor, 2013.

2. List Essential References Materials (Journals, Reports, etc.)

- D. A. McQuarrie, J. D. Simon. Physical Chemistry: A Molecular Approach. University Science Books, 1997.
- J. D. Lee, Concise Inorganic Chemistry, 5th ed., Wiley-Blackwell, 1998.

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

- Inorganic Chemistry Catherine Housecroft and Alan G. Sharpe, 4th ed. Pearson, 2012.
- H. B. Gray. Chemical Bonds: An Introduction to Atomic and Molecular Structure, University Science Books, 1994.

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- http://www.chemweb.com
- http://www.sciencedirect.com
- http://www.rsc.org

- 5. Other learning material such as computer-based programs/CD, professional standards or regulations and software. : **- Not required.**

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- Equipped lecture halls.

2. Computing resources (AV, data show, Smart Board, software, etc.)

- Room equipped with computer, data show and TV.

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- No other requirements.

G. Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Questionnaire evaluation of the course each semester.

2. Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- Preparation of a course report and study of the results of the students to give us indication about the planned outputs and the extent to which student's benefits.

3. Processes for Improvement of Teaching

- Exchange of experiences internal and external.
- Application of e-learning.
- Review of strategies proposed.
- Providing new tools for learning.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- Check marking of a sample of exam papers, or student work.

- Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.

5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- Consulting other staff of the course.
- Hosting a visiting staff to evaluate of the course.
- Workshops for teachers of the course.
- Periodic review of the contents of the syllabus and modify the negatives.

Faculty or Teaching Staff: **Dr. Mona Alhasani**

Signature: **Date Report Completed: 29/11/2015**

Received by: Dr. Ismail Althagafi **Department Head**

Signature: **Date:** _______________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Chemistry of the Main Group Elements

4022141-2
Course Specifications
(CS)

1436/1437 H

2015/2016 AD

Course Specifications

Institution: **Umm Al-qura University** Date of Report: **2015**

College/Department : **Faculty of Applied Sciences/ Department of Chemistry**

A. Course Identification and General Information

1. Course title and code: **Chemistry of the Main Group Elements / 4022141-2**
2. Credit hours: **2** hours (**theoretical**)
3. Program(s) in which the course is offered. **Chemistry**
4. Name of faculty member responsible for the course: **Dr. Mona Alhasani**
5. Level/year at which this course is offered: **4th level/2nd year**
6. Pre-requisites for this course (if any): General Chemistry 2
7. Co-requisites for this course (if any): -
8. Location if not on main campus: **both on El-Abedyah and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ☒ What percentage? **100%**

b**. Blended (traditional and online)** What percentage?

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage? ☐

Comments:

B Objectives

1. What is the main purpose for this course?

By the end of this course, the student should fully aware of:

a. The main group elements in the periodic table.

b. The chemical properties of the main group elements through their reactions.

c. The existence and most important compounds of the main group elements.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

- Encourage students to carry out reports in the field of chemistry of main group elements.
- Using different learning sources of the course, so that the students make use of more than one reference.
- The use of smart teaching halls for lectures.

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
• General and periodic properties of main group (non-transition) elements; electronic structure, size, electron affinity, ionization, electronegativity & electropositivity and oxidation states.	2	4
• Horizontal, perpendicular and diagonal relationships in periodic table	1	2
• Hydrogen and its position & properties, its isotopes and chemical properties.	1	2
• s-bolck elements; electronic configuration, size, hardness, melting points – chemical properties; chemical reactivity with metals, nitrogen, acids, complexes formation – solubility and hydration – solubility in ammonia	3	6
• Halides – some chemical properties of lithium and magnesium – diagonal relationship between lithium and magnesium elements.	1	2
• Chemical properties of beryllium and differences between it and second group elements – diagonal relationship between beryllium and aluminum.	1	2

• p-block elements; their electronic configuration, properties and their compounds – properties of the first element in each group and compare it with the last element – inert pair effect –metallic and non-metallic properties of groups.	3	6
• Independent study of the third, fourth, fifth, sixth, seventh and inert gases groups.	2	4

II-General scheme for identification of organic aliphatic unknown

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	-		-		28
Credit	2	-		-		2

3. Additional private study/learning hours expected for students per week.

- Each student spends 2 hrs each weak in preparing reports and their discussions.

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy.

	NQF Learning Domains And Course Learning Outcomes	**Course Teaching Strategies**	**Course Assessment Methods**
1.0	**Knowledge**		
1.1	Know the general and periodic properties of main group (non-transition) elements including their atomic and ionic size, ionization potential, electron affinity, electro-negativity and physical properties.	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios
1.2	Recognize the horizontal, perpendicular and diagonal relationships in periodic table		
1.3	List the chemical properties of hydrogen and its isotopes.		
1.4	Define s-bolck elements and recognize their properties.		
1.5	Describe halides and state some chemical properties of lithium and magnesium and definition of the diagonal relationship between lithium and magnesium.		
1.6	Recall ord the chemical properties of beryllium and recognize the differences between it and second group		

	elements		
1.7	Define the p-bolck elements and recognize their properties.		
1.8	Remember the third, fourth, fifth, sixth, seventh and inert gases groups.		
2.0	**Cognitive Skills**		
2.1	Summarize the general and periodic properties of main group (non-transition) elements including their atomic and ionic size, ionization potential, electron affinity, electro-negativity and physical properties.	• Lectures • Scientific discussion • Library visits • Web-based study	• Periodic and final exams. • Web-based student performance systems. • Reports.
2.2	Compare between the horizontal, perpendicular and diagonal relationships in periodic table		
2.3	Interpret the chemical properties of s-bolck elements.		
2.4	Evaluate the diagonal relationship between lithium and magnesium.		
2.5	Compare between beryllium and second group elements		
2.6	Define the chemical properties of p-bolck elements.		
3.0	**Interpersonal Skills & Responsibility**		
3.1			
3.2			
4.0	**Communication, Information Technology, Numerical**		
	• Evaluate the general properties of the periodic table • Interpret the chemical and physical properties of the groups of s and p-blocks. • Use information and communication technology. • The ability to use e-mail to communicate with the instructor and other students. • Scientific writing. • Use his/her observations to solve problems.	• Lectures • Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
5.0	**Psychomotor**		
5.1	NOT APPLICABLE		
5.2			

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment

1	Homework or activities.	--	10 %
2	First Periodic Exam.	6	20 %
3	Second Periodic Exam.	12	20 %
4	Final Exam.	16	50 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- Office hours: During the working hours weekly.
- Academic advising for students.
- Availability of staff members to provide counselling and advice.

E. Learning Resources

1. List Required Textbooks
   - A. G. Massey, Main Group Chemistry, 2nd Edition, Wiley, 2000.
2. List Essential References Materials (Journals, Reports, etc.)
   - Das, Kumar V.G, Main Group Elements and their Compounds, Springer, 1996.
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)
   - F. A. Cotton and G. Wilkinson, Advanced Inorganic Chemistry, A comprehensive text, 1988, John Wiley & Sons.
4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)
   - **http://www.chemweb.com**
   - **http://www.sciencedirect.com**
   - **http://www.rsc.org**
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)
   - **Classrooms capacity (30) students.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

- Rooms equipped with computers and projectors**.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)
   - **No other requirements.**

G. Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Questionnaire evaluation of the course in particular.

2 . Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- Preparation of a course report and study of the results of the students to give us indication about the planned outputs and the extent to which student's benefits.

3. Processes for Improvement of Teaching

- Application of e-learning.
- Exchange of experiences internal and external.
- Review of strategies proposed.
- Providing new tools for learning.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- Check marking of a sample of exam papers, or student work.
- Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- Periodic Review of the contents of the syllabus and modify the negatives.
- Consult other staff of the course.
- Hosting a visiting staff to evaluate of the course.
- Workshops for teachers of the course.

Faculty or Teaching Staff: **Dr. Mona Alhasani**

Signature: **Date Report Completed: 29/11/2015**

Received by: Dr. Ismail Althagafi **Department Head**

Signature: ______________________________ **Date:** _______________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Chemistry of Transition Elements

4023552-2

Course Specifications

(CS)

1436/1437 H

2015/2016 AD

Course Specifications

Institution: **Umm Al-qura University** Date of Report: **2015**

College/Department : **Faculty of Applied Science/ Department of Chemistry**

A. Course Identification and General Information

1. Course title and code: **Chemistry of Transition Elements / 4023552-2**
2. Credit hours: **2 (theoretical)**
3. Program(s) in which the course is offered: **Chemistry**
4. Name of faculty member responsible for the course: **Dr. Hoda El-Ghamry**
5. Level/year at which this course is offered: **5th level/3th year**
6. Pre-requisites for this course (if any): **Chemistry of the Main Group Elements**
7. Co-requisites for this course (if any): -
8. Location if not on main campus: **both on El-Abedyah and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ■ What percentage? **100%**

b. **Blended (traditional and online)** What percentage?

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage? ☐

Comments:

B. Objectives

1. What is the main purpose for this course?

By the end of this course student will be familiar with:

a. The properties of the main transition elements.

b. The properties of the inner transition elements depending on the periodic properties in the periodic table in addition to a comparative studies of the elements in their groups.

c. The spectroscopic and magnetic properties of the transition elements.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

- Encourage students to carry out reports in the field of chemistry of transition elements.
- Using different learning sources of the course, so that the students make use of more than one reference.
- The use of smart teaching halls for lectures.

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
• The site transition elements in the periodic table.	1	2
• d-block elements, first transition series (3d), second transition series (4d) and third transition series (5d).	2	4
• f-block elements: lanthanides series (4f) and actinides series (5f).	1	2
• Differences between d-block and f-block elements.	1	2
• Comparisons between 4d and s, p block elements.	1	2
• Characteristic properties of first transition series.	1	2
• Magnetic properties from crystal field theory.	1	2

• Electronic distribution of electrons in d orbitals on octahedral complexes.	1	2
• Comparison between the properties of first transition series (3d) with the second transition series (4d) and third transition series (5d).	1	2
• Comparative studies of transition elements in their groups; scandium group, titanium group, vanadium group, chromium group, manganese group, iron, cobalt & nickel groups, copper group, and zinc group.	2	4
• f-block elements: studies of lanthanides and actinides in comparison with scandium group in terms of abundance, electronic configuration, oxidation states and lanthanides contraction.	1	2
• Spectroscopic and magnetic properties – difference between 4f and 5f and its effect on chemical behavior.	1	2

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	-		-		28
Credit	2	-				2

3. Additional private study/learning hours expected for students per week.

- Each student spends 2 hrs each weak in preparing reports and their discussions.

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Describe the site of transition elements in the periodic table.	• Lectures • Scientific discussion • Library visits • Web-based study	• Periodic and final exams. • Web-based student performance systems. • Reports.
1.2	Recall d-block elements		
1.3	Know the f-block elements by its two series; lanthanides (4f) and actinides (5f).		
1.4	Describe the characteristic properties of first transition series.		
1.5	Identify the magnetic properties from crystal field theory.		
1.6	Recognize the electronic distribution of electrons in d orbitals on octahedral complexes.		
1.7	Remember the transition elements in their groups; scandium group, titanium group, vanadium group, chromium group, manganese group, iron group, cobalt group, nickel group, copper group, and zinc group.		
1.8	List lanthanides and actinides (f-block elements) in comparison with scandium group (abundance, electronic configuration, oxidation states and lanthanides contraction).		
1.9	Recognize the spectroscopic and magnetic properties of the d- and f-block elements		
2.0	**Cognitive Skills**		
2.1	Explain the site of transition elements in the periodic table.	• Lectures	• Periodic and

2.2	Compare between d-block and f-block elements.	• Scientific discussion • Library visits • Web-based study	final exams. • Web-based student performance systems. • Reports.
2.3	Differentiate between d-block elements with s & p block elements.		
2.4	Clarify the characteristic properties of first transition series.		
2.5	Compare between the properties of first transition series (3d) with the second transition series (4d) and third transition series (5d).		
2.6	Subdivide the f-block elements into lanthanides and actinides and compare them with scandium group (abundance, electronic configuration, oxidation states and lanthanides contraction)		
2.7	Predict the spectroscopic and magnetic properties of the d- and f-block elements		
3.0	**Interpersonal Skills & Responsibility**		
• . • Ability to communicate results of work to classmates. Ability to work in a team to perform a specific task.		• Scientific discussion • Web-based study	• Web-based student performance systems.
4.0	**Communication, Information Technology, Numerical**		
• Predict the site of the transition elements in the periodic table. • Interpret the properties of the transition elements in their groups including scandium group, titanium group, vanadium group, chromium group, manganese group, iron group, cobalt group, nickel group, copper group, and zinc group.		• Lectures • Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations

	• Enhancing the ability of students to use computers and internet. • Interpret chemical data • Present chemical data orally. • Know how to write a report.		
5.0	**Psychomotor**		
5.1	NOT APPLICABLE		
5.2			

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	First Periodic Exam.	6	20 %
3	Second Periodic Exam.	12	20 %
4	Final Exam.	16	50 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- Office hours: During the working hours weekly.
- Academic Advising for students.
- Availability of Staff members to provide counselling and advice.

E. Learning Resources

2. List Essential References Materials (Journals, Reports, etc.)

- Lecture hand outs available on the coordinator website

1. List Required Textbooks

- R. Gopalan " *Textbook of Inorganic Chemistry 1st Edition"* **2011,** *CRC Press*.
- T. W. Graham Solomons, Craig B. Fryhle, Scott A. Snyder "*Organic Chemistry, 11th Edition, International Student Version*" **2013**, John Wiley & Sons.

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

- Amit Arora "*Introductory Organic Chemistry*" **2006**, Discovery Publishing House New Delhi
- Eleanor Crabb, Elaine Moore, Lesley Smart "*Concepts in Transition Metal Chemistry*" **2010**, Royal Society of Chemistry.
- Kazuo Nakamoto "Infrared and Raman Spectra of Inorganic and Coordination Compounds" **2009,** John Wiley &Sons.

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- **http://www.chemweb.com**
- **http://www.sciencedirect.com**
- **http://www.rsc.org**

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software: None

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- Classrooms capacity (30) students.

2. Computing resources (AV, data show, Smart Board, software, etc.)

- Room equipped with computers and projectors**.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- No other requirements.

G. Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Questionnaire evaluation of the course in particular.

2 . Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- Preparation of a course report and study of the results of the students to give us indication about the planned outputs and the extent to which student's benefits.

3. Processes for Improvement of Teaching

- Application of e-learning.
- Exchange of experiences internal and external.
- Review of strategies proposed.
- Providing new tools for learning.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- Check marking of a sample of exam papers, or student work.
- Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- Periodic Review of the contents of the syllabus and modify the negatives.
- Consult other staff of the course.
- Hosting a visiting staff to evaluate of the course.
- Workshops for teachers of the course.

Faculty or Teaching Staff: **Dr. Hoda El-Ghamry**

Signature: **Date Report Completed: 29/11/2015**

Received by: **Dr. Ismail Althagafi** **Department Head**

Signature: ________________________________ **Date:** _______________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Coordination Chemistry

4023564-3

Course Specifications

(CS)

1436/1437 H

2015/2016 AD

Course Specifications

Institution: **Umm Al-qura University** Date of Report: **2015**

College/Department : **Faculty of Applied Sciences / Chemistry Department**

A. Course Identification and General Information

1. Course title and code: **Coordination Chemistry / 4023564-3**
2. Credit hours: **3 (2 theoretical +1 practical)**
3. Program(s) in which the course is offered: **Chemistry**
4. Name of faculty member responsible for the course: **Prof. Abdalla Mohamed Khedr**
5. Level/year at which this course is offered: 6th **level/3rd year**
6. Pre-requisites for this course (if any): **-** Chemistry of Transition Elements
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **both on El-Abedyah and El-Zaher**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ☒ What percentage? 100%

b. Blended (traditional and online) What percentage? ☐

c. e-learning ☐ What percentage?

d. Correspondence ☐ What percentage?

f. Other What percentage? ☐

Comments:

B. Objectives

1. What is the main purpose for this course? By ending this course, students should be familiar with: a. The nature, types, naming and importance of coordination compounds. b. The different theories explaining the bonding in metal complexes. c. The preparation methods of coordination compounds. **d.** The spectral, magnetic and biological properties of metal complexes.
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) • Using different learning sources of the course, so that the students make use of more than one reference. • Encourage students to carry out reports in the field of coordination chemistry including preparation and study of some physical and chemical properties and link the practical side with the theoretical one in order to understand the nature of coordination compounds. • The use of smart teaching halls for lectures.

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached):

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact Hours
• Introduction to the chemistry of coordination compounds - Werner theory of coordination compounds - Effective atomic number.	2	4
• Ligands – nomenclature of metal complexes – symmetry in metal complexes.	1	2

- Valence bond theory – coordination numbers and geometrical structures – inner and outer complexes.	2	4
- Stability of metal complexes; factors affecting the stability of metal complexes – ionic and ionization potential – geometrical arrangement of ligands around the central metal ion - metal chelates.	2	4
- Crystal field theory; ligand field in octahedral complexes – ligand field in tetrahedral complexes – ligand field in square planer complexes – Jahn-Teller effect (distortion from symmetrical arrangement) – crystal field stabilization energies.	2	4
- Preparation of coordination compounds (complexes); direct reactions – oxidation and reduction reactions – thermal decomposition reactions.	2	4
- Electronic spectrum of complexes - infrared spectra of the metal complexes.	1	2
- Metal complexes of significant biological activities.	2	4
Laboratory Part:		
- Introduction about coordination chemistry and safety rules in labs.	**1**	**3**
- Preparation of $[Cu(en)_2](NO_3)_2$	**2**	**6**
- Preparation of $[Co(NH_3)_5Cl]Cl_2$	**2**	**6**
- Preparation of $K_3[Cr(C_2O_4)_3]$	**2**	**6**
- Preparation of $[Ni(en)_3]Cl_2.2H_2O$	**2**	**6**
- Preparation of [Fe(acac)3]	**1**	**3**
- Melting points of the metal complexes.	**1**	**3**
- Solubility of the metal complexes.	**1**	**3**
- Conductivity of the metal complexes.	**1**	**3**
- Final practical exam.	**1**	**3**

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	**28**	**-**	**42**			**70**
Credit	**2**	**-**	**1**			**3**

3. Additional private study/learning hours expected for students per week.

- The student spends two hours a week to prepare reports, discuss and resolve questions.

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	**Course Teaching Strategies**	**Course Assessment Methods**
1.0	**Knowledge**		
1.1	Describe the nature, types and importance of coordination compounds.	• Lectures • Scientific discussion • Use the library to work duties and a small research on the nature and types of metallic complexes. • Use of the Internet to carry out some reports on course subjects.	• Written mid-term and final exams. • Long and short essays.
1.2	Explain the preparation methods of coordination compounds.		
1.3	Name the complexes according to the IUPAC system.		
1.4	Determine the mode of bonding in metal complexes using bonding theories.		
1.5	Mention the important applications of metal complexes.		

2.0	**Cognitive Skills**		
2.1	Confirm the molecular formula of metal complexes.	• Lectures • Scientific discussion • Library visits • Web-based study	• Periodic tests and assignments and practical experiments. • Measuring the response to the assignments.
2.2	Estimate the type of metal complex.		
2.3	Apply the analytical calculations to know the complex.		
2.4	Design scientific methods and think to solve problems concerning the course.		
3.0	**Interpersonal Skills & Responsibility**		
• Ability to work in a team to perform a specific experimental tasks. • Ability to work independently to handle chemicals • Ability to communicate results of work to classmate and participation in class or laboratory discussions		• Class discussions • Research activities	• Performance on in-practical exams. • Work on research activity. • Overall student performance in Lab. discussions • Cross questions after finishing laboratory work
4.0	**Communication, Information Technology, Numerical**		
4.1	Evaluate the different methods of preparation of inorganic compounds	• The use of computers in the training room of	• Web-based student performance systems • Individual and group
4.2	Use computers and the international information network (the Internet) to		

	perform calculations and to identify recent research relevant to decision sources.	the department. • Visiting research centers. • Using the internet for collecting data.	presentations. • Evaluation of the duties associated with the proper use of numerical and communication skills.
	Perform mathematical calculations and data analysis.		
5.0	**Psychomotor**		
5.1 5.2	Laboratory practice . including 1.Locate Materials Safety Data Sheets, chemicals carcinogens list, and hazardous chemicals list. 2. Handle chemicals safely with a proper PPE 3.Dilute solutions, repeat analysis and calculate true result for all procedures performed as required. 4.Pipette accurately at all times 5. Titrate and weight efficiently in right way 6.Dispose the hazardous solution in right way	Practical session should include both demonstration and experiments .	1.Repetition of the experiments , to reproduce the results 2.Written report of chart and procedures. 3.The students should be able to correlate their results with experimental conditions

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	Midterm Exam.	8	20 %
3	Practical Exam.	14	30 %
4	Final Exam.	16	40 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- Availability of Staff members to provide counseling and advice.
- Office hours: During the working hours weekly.

- Academic Advising for students.

E. Learning Resources

1. List Required Textbooks
   - P. L. Soni, Vandna Soni, Coordination Chemistry: Metal Complexes, CRC Press, 2013.
2. List Essential References Materials (Journals, Reports, etc.)
   - Geoffrey A. Lawrance, Introduction to Coordination Chemistry, John Wiley & Sons, 2009.
   - William L. Jolly, Modern Inorganic Chemistry; (2nd edition) McGraw-Hill, New York, 1991.
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)
   - Kazuo Nakamoto, Infrared and Raman Spectra of Inorganic and Coordination Compounds, John Wiley &Sons, 2009.
   - James E. Huheey , Inorganic chemistry , Prentic Hall ; (4th edition) , 1997
4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)
   - http://www.chemweb.com
   - http://www.sciencedirect.com
   - http://www.rsc.org
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software. : **- Not required.**

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)
   - Equipped lecture halls and laboratories equipped specializing in inorganic chemistry.

2. Computing resources (AV, data show, Smart Board, software, etc.)

- Room equipped with computers, data show and TV.

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- **No other requirements.**

G. Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Complete the questionnaire evaluation of the course in particular.

2. Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- Preparation of a course report and study of the results of the students to give us indication about the planned outputs and the extent to which student's benefits.

3. Processes for Improvement of Teaching

- Training programs and workshops for Staff member.
- Review of strategies proposed.
- Providing new tools for learning.
- The application of e-learning.
- Eexchange of experiences internal and external.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- Check marking of a sample of exam papers, or student work.
- Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.

5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- Periodic review of the contents of the syllabus and modify the negatives.
- Consult other staff of the course.
- Hosting a visiting staff to evaluate of the course.

- Workshops for teachers of the course.

Faculty or Teaching Staff: Prof. Abdalla Mohamed Khedr

Signature: **Date Report Completed: 29/11/2015**

Received by: Dr. Ismail Althagafi **Department Head**

Signature: ________________________________ **Date:** _______________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Chemistry of Inorganic Industries

4024774-2

Course Specifications
(CS)

1436/1437 H
2015/2016 AD

Course Specifications

Institution: **Umm Al-qura University** Date of Report: **2015**

College/Department : **Faculty of Applied Sciences / Chemistry Department**

A. Course Identification and General Information

1. Course title and code: **Chemistry of Inorganic Industries / 4024774-2**
2. Credit hours: **2 (theoretical)**
3. Program(s) in which the course is offered: **Industrial Chemistry**
4. Name of faculty member responsible for the course: **Prof. Abdalla Mohamed Khedr**
5. Level/year at which this course is offered: **7th level/4th year**
6. Pre-requisites for this course (if any): **-** Chemistry of Transition Elements
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **El-Abedyah**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ■ What percentage? **100%**

b**. Blended (traditional and online)** What percentage?

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage? ☐

Comments:

B. Objectives

1. What is the main purpose for this course?

The goal of this course is to familiarize students with:

a. The importance of industrial inorganic chemistry and its future role.

b. Types of glass, its structure, raw materials and different methods for manufacturing of glass.

c. Ceramic, porcelain, iron and fertilizers industries.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

- Encourage students to carry out reports in the field of cement industry and modern building materials.
- The use of smart teaching halls for lectures.
- Using different learning sources of the course, so that the students make use of more than one reference.

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached):

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
• Glass industry: the types of raw materials – structure of glass - chemical reactions - different methods for manufacturing of glass.	**1**	**2**
• Types of glass: low silica and high silica glass - glass sensitive to light - safety glass and glassy ceramics.	**1**	**2**

- Ceramic industry: basic raw materials - chemical transformations in the ceramic industry.	**1**	**2**
- Porcelain industry: the product of constructivism clay - special ceramic products such as ferro-electric and ferro-magnetic ceramics.	**2**	**4**
- Iron industries: basic raw materials - interactions in blast furnace - the different types of iron and their properties.	**2**	**4**
- Iron corrosion and its resistance – curves of iron and different compounds.	**1**	**2**
- Acids and bases of industrial importance: sulfuric, nitric acids and their compounds as well as their economic importance.	**2**	**4**
- Ammonia - nitrogen – fixation of atmospheric nitrogen - liquid nitrogen and its uses.	**1**	**2**
- Chemistry of fertilizers: nitrogenic fertilizers.	**1**	**2**
- Phosphates fertilizers.	**1**	**2**
- Complex fertilizers.	**1**	**2**

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	-		-		28
Credit	2	-		-		2

3. Additional private study/learning hours expected for students per week.

- Two hours a week to prepare reports, discuss and resolve questions related to cement industry, modern building materials and other subjects of the course.

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment

Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	• Recall types of raw materials and different ways to manufacture of glass.	• Use the library to work duties and small researches on subjects of the course. • Use of the Internet to carry out some reports. • Lectures. • Scientific discussion.	• Long and short essays. • Written mid-term and final exams.
1.2	• Know types of glass.		
1.3	• Describe the acids and bases of industrial importance.		
1.4	List some of iron industries		
1.5	Write on chemistry of fertilizers.		
2.0	**Cognitive Skills**		
2.1	• Summarize the basic raw materials used in iron industries.	• Lectures • Scientific discussion • Library visits • Web-based study	• Periodic tests and assignments. • Measuring the response to the assignments.
2.2	• Analyze curves of iron and different compounds.		
2.3	• Compare between nitrogenic and phosphates fertilizers.		
2.4	• Estimate the special ceramic products.		
3.0	**Interpersonal Skills & Responsibility**		
3.1	Operate in team work and accept his college's opinions.	• Dividing students into groups to carry out	• Evaluate the results of collective works and duties as well as
3.2	• Develop the student's ability in self-		

	reliance and responsibility.	collective scientific reports. • Periodic individual duties to develop the skill of taking responsibility and self-reliance	knowing the contribution of each individual through dialogue and discussion. • Assessment of individual tasks and duties to determine the student's ability to self-reliance.
3.3	• Choose the best methods for manufacturing of glass.		
4.0	**Communication, Information Technology, Numerical**		
4.1	Use computers and the international information network (the Internet) to perform calculations and to identify recent research relevant to decision sources.	• Using the internet for collecting data. • The use of computers in the training room of the department. • Visiting research centers.	• Evaluation of the duties associated with the proper use of numerical and communication skills. • Web-based student performance systems • Individual and group presentations.
4.2	Perform mathematical calculations and data analysis.		
5.0	**Psychomotor**		
5.1	• Not applicable.		
5.2			

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %

2	First Periodic Exam.	6	20 %
3	Second Periodic Exam.	12	20 %
4	Final Exam. (2hours exam)	16	50 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- Availability of Staff members to provide counseling and advice.
- Academic Advising for students.
- Office hours: During the working hours weekly.

E. Learning Resources

1. List Required Textbooks

- Fundamentals of Materials Science and Engineering, William D. Callister, David G. Rethwisch, 4th Edition SI Version, Wiley, 2012.

2. List Essential References Materials (Journals, Reports, etc.)

- Solid State Chemistry and its Applications, Anthony R. West, 2nd Edition, Student Edition, Wiley, 2014.

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

- Introduction to Glass Science and Technology: RSC (RSC Paperbacks), James E. Shelby, Royal Society of Chemistry; 2nd edition, 2005.

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- http://www.chemweb.com
- http://www.sciencedirect.com
- http://www.rsc.org

5. Other learning material such as computer-based programs/CD, professional standards or

regulations and software. : - Not required**.**

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- Equipped lecture halls.

2. Computing resources (AV, data show, Smart Board, software, etc.)

- Room equipped with computer, data show and TV.

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- No other requirements.

G. Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Questionnaire evaluation of the course.

2. Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- Preparation of a course report and study of the results of the students to give us indication about the planned outputs and the extent to which student's benefits.

3. Processes for Improvement of Teaching

- Application of e-learning.
- Review of the proposed strategies.
- Providing new tools for learning.
- Exchange of experiences internal and external.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- Check marking of a sample of exam papers, or student work.

- Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.

5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- Workshops for teachers of the course.
- Periodic Review of the contents of the syllabus and modify the negatives.
- Consult other staff of the course.
- Hosting a visiting staff to evaluate of the course.

Faculty or Teaching Staff: Prof. Abdalla Mohamed Khedr

Signature: **Date Report Completed: 29/11/2015**

Received by: Dr. Ismail Althagafi **Department Head**

Signature: ________________________________ **Date:** _______________

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Chemistry of Cement and Construction Materials

40247840-2

Course Specifications

(CS)

1436/1437 H

2015/2016 AD

Course Specifications

Institution: **Umm Al-qura University**	Date of Report: **2015**
College/Department : **Faculty of Applied Sciences / Chemistry Department**	

A. Course Identification and General Information

1. Course title and code: **Chemistry of Cement and Construction Materials/ 40247840-2**
2. Credit hours: **2 (theoretical)**
3. Program(s) in which the course is offered: **Industrial Chemistry**
4. Name of faculty member responsible for the course: **Prof. Dr. Abdalla Mohamed Khedr**
5. Level/year at which this course is offered: **8th level/4th year**
6. Pre-requisites for this course (if any): **-** Chemistry of Transition Elements
7. Co-requisites for this course (if any)---
8. Location if not on main campus: **El-Abdyah**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom ■ What percentage? **100%**

b**. Blended (traditional and online)** What percentage?

c. e-learning ☐ What percentage? ☐

d. Correspondence ☐ What percentage? ☐

f. Other ☐ What percentage? ☐

Comments:

B. Objectives

1. What is the main purpose for this course?

The goal of this course is to familiarize students with:

a. Cement industry and its importance.

b. Cement manufacturing methods, raw materials used, purification of cement, special types of cement and their uses.

c. Modern building materials.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

- Using different learning sources of the course, so that the students make use of more than one reference.
- Encourage students to carry out reports in the field of cement industry and modern building materials.
- The use of smart teaching halls for lectures.

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached):

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
• Introduction to the cement industry and its importance. • Portland cement: manufacturing methods - the raw materials used.	**1**	**2**
• Chemical transformations and energy requirements - wet and dry manufacturing methods.	**1**	**2**
• Compounds entering in the cement industry.	**1**	**2**

• Precipitation and purification of cement – special types of cement and their uses.	**2**	**4**
• Lime: raw materials - energy changes and chemical transformations - manufacturing outputs.	**2**	**4**
• Gypsum and other calcium compounds.	**1**	**2**
• Cement Oxy magnesium chloride – other magnesium compounds used in construction and chemical processing.	**1**	**2**
• Effort and tensile curves for cement and gypsum.	**1**	**2**
• Refractories industry and their different types, Refractories have resistance to heat and acids.	**2**	**4**
• Modern building materials.	**2**	**4**

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	14	-		-		28
Credit	2	-		-		2

3. Additional private study/learning hours expected for students per week.

- Two hours a week to prepare reports, discuss and resolve questions related to cement industry and modern building materials.

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	**Course Teaching Strategies**	**Course Assessment Methods**

1.0	**Knowledge**		
1.1	• Know manufacturing methods of Portland cement and the raw materials used in these processes.	• Lectures • Scientific discussion • Use the library to work duties and a small research on cement industry and modern building materials. • Use of the Internet to carry out some reports on course subjects.	• Written mid-term and final exams • Long and short essays.
1.2	Write on the cement industry and its importance.		
1.3	Recall the chemical transformations and energy requirements.		
1.4	Describe the special types of cement and their uses.		
1.5	List the compounds entering in the cement industry		
2.0	**Cognitive Skills**		
2.1	Compare between wet and dry manufacturing methods.	• Lectures • Scientific discussion • Library visits • Web-based study	• Periodic tests and assignments. • Measuring the response to the assignments.
2.2	Estimate the refractories have resistance to heat and acids.		
2.3	Summarize the modern building materials		
2.4	Analyze effort and tensile curves for cement and gypsum.		
3.0	**Interpersonal Skills & Responsibility**		
3.1	Develop the student's ability in self-reliance and responsibility.	• Dividing students into groups to carry out	• Evaluate the results of collective works and duties as well as
3.2	• Choose the compounds used in		

	construction and their chemical treatment.	collective scientific reports. • Periodic individual duties to develop the skill of taking responsibility and self-reliance	knowing the contribution of each individual through dialogue and discussion. • Assessment of individual tasks and duties to determine the student's ability to self-reliance.
3.3	Operate in team work and accept his college's opinions.		
4.0	**Communication, Information Technology, Numerical**		
4.1	Perform mathematical calculations and data analysis.	• The use of computers in the training room for the department. • Using the internet for collecting data.	• Web-based student performance systems • Individual and group presentations. • Evaluation of the duties associated with the proper use of numerical and communication skills
4.2	Use computers and the international information network (the Internet) to perform calculations and to identify recent research relevant to decision sources.		
5.0	**Psychomotor**		
5.1	• Not applicable.		
5.2			

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework or activities.	--	10 %
2	First Periodic Exam.	6	20 %

3	Second Periodic Exam.	12	20 %
4	Final Exam. (2hours exam)	16	50 %
5	**Total**	**100 %**	

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- Academic Advising for students.
- Availability of Staff members to provide counseling and advice.
- Office hours: During the working hours weekly.

E. Learning Resources

1. List Required Textbooks

- Cement Chemistry, I. Richardson, H. F. W. Taylor, ICE Publishing, 3rd edition, 2015.

2. List Essential References Materials (Journals, Reports, etc.)

- Lea's Chemistry of Cement and Concrete, P. Hewlett, Butterworth-Heinemann, 4th edition, 2004.

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

- Chemistry For The Engineering and Applied Sciences, W. Steedmann, R. B. Snadden, I. H. Anderson, Pergamon Press, Oxford, 2nd edition, 1986.

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- http://www.chemweb.com
- http://www.sciencedirect.com
- http://www.rsc.org

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software. : **-** Not required**.**

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) • Equipped lecture halls.

2. Computing resources (AV, data show, Smart Board, software, etc.) • Room equipped with computer, data show and TV.
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) • No other requirements.

G. Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching • Questionnaire evaluation of the course.
2. Other Strategies for Evaluation of Teaching by the Program/Department Instructor • Preparation of a course report and study of the results of the students to give us indication about the planned outputs and the extent to which student's benefits.
3. Processes for Improvement of Teaching • Providing new tools for learning. • Exchange of experiences internal and external. • Application of e-learning. • Review of the proposed strategies.
4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) • Check marking of a sample of exam papers, or student work. • Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.

5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- Consult other staff of the course.
- Hosting a visiting staff to evaluate of the course.
- Workshops for teachers of the course.
- Periodic review of the contents of the syllabus and modify the negatives.

Faculty or Teaching Staff: **Prof. Dr. Abdalla Mohamed Khedr**

Signature: **Date Report Completed: 29/11/2015**

Received by: Dr. Ismail Althagafi **Department Head**

Signature: ________________________________ **Date:** _______________

Faculty and University Courses

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

COURSE SPECIFICATION

Course title **General Biology**

Course code: **4011101-4**

Revised September 2015

Kingdom of Saudi Arabia
National Commission for
Academic Accreditation &
Assessment

المملكة العربية السعودية
الهيئة الوطنية للتقويم
والاعتماد الأكاديمي

Course Specification

For Guidance on the completion of this template, please refer to of Handbook 2 Internal Quality Assurance Arrangements

Institution: UM AL – QURA UNIVERSITY

College/Department : Faculty of Applied Science – Department of Biology

A Course Identification and General Information

1. **Course title** General Biology
2. **Course code:** 4011101-4

2. **Credit hours:** 4hrs

3. **Program(s) in which the course is offered. :** BSc Microbiology

3. **Name of faculty member responsible for the course:**
   Botany academic staff members / Zoology academic staff members

5. **Level/year at which this course is offered:** 1st Year / Level 2
6. **Pre-requisites for this course (if any):** ---
7. **Co-requisites for this course (if any):** ---
8. **Location if not on main campus:** Main campus

B Objectives

After completing this course student should be able to:

1. Define the principles and concepts of the living cells.
2. Differentiate between animal and plant cells
3. Aware of the protoplasmic and non-protoplasmic cell contents and its structure and function.
4. Study the different types of animal and plants tissues (structure and function).
5. Understand the biological activities of the living cells.

C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached):

The course will cover the principle of eukaryotic cell structure and function. This course will provide a conceptual and experimental background in biology sufficient to enable students to take courses that are more advanced in related fields.

1 Topics to be Covered

Topic	No of Weeks	Contact hours
❖ **Introduction:** - The living cells. - Basis of cytology and histology. -Major differences between Eukaryotic and Prokaryotic cells. -Major differences between plant and animal cells	**1**	**3**
❖ **Plant cell morphology and structure I** - Cell wall, middle lamella, types of pits. - Structure and function. - Cytoplasmic ultra structure and function: Endoplasmic reticulum; mitochondria; Golgi apparatus, ribosomes	**1**	**3**

❖ **Plant cell morphology and structure II** - Plastids, chloroplasts, chromoplast, leucoplast types, morphology, ultra structure and function, distribution. -Non protoplasmic contents of plant cell (cell vacuole – carbohydrates – proteins – fats and oils – crystals glycosides – latex – alkaloids – tannins – organic acids) .	**1**	**3**
❖ **Animal cell morphology and structure I** **-Fine structure of the Cell membrane and Cell junctions** **-Functions of cell membrane (cell transport)** **-Mitochondria, Peroxisomes,** **Lysosomes (phagocytosis, autocytosis and pinocytosis** **Centrioles, cytoskeleton, microtubules and microfilaments,**	**1**	**3**
❖ **Animal / Plant cell morphology and structure: The Nucleus** **-Nucleus, nuclear envelope, nucleopores, nucleoplasm, chromatin and nucleolus. Mitochondria, Golgi apparatus and functions of each organell.** **-**	**1**	**3**
❖ **Plant morphology and anatomy** **-Meristematic tissues in plants – classification of meristematic tissues – Apical and lateral meristems- Permanent tissues. Dermal system, ground system and vascular system. Ground system; parenchyma cell, collenchyma cell and sclerenchyma cell.** **Seed germination, conditions necessary for seed germination, dicotyledonous seeds and seedling 1) broad bean (*Vicia faba*), kidney bean (*Phaseolus vulgaris*), monocotyledonous seeds and seedling 1) maize (*Zea mays*)**	**1**	**3**
Plant morphology **Morphology of the root – functions of the root, zones of the root, types of the roots, Adventitious roots**	**1**	**3**
Plant morphology **Morphology of the stem- functions of the stem- origin, functions and types of the buds- Stem branching- habit of the stem- Metamorphosis of the stem.**	**1**	**3**
❖ **Plant morphology** **Morphology of the leaf- functions of the leaf- parts of the leaf- Arrangement of the leaf- types of the leaf- leaf venation- leaf metamorphosis**		

❖ **Animal Histology I** -Introduction to Animal tissues difference and distribution of the animal tissues in the human body -Epithelial tissues, simple and stratified epithelia, glandular epithelia	**1**	**3**
❖ **Animal Histology II** -Connective tissues : Types of Cartilages Types of Bones Blood components	**1**	**3**
❖ **Animal Histology III** -Muscular tissues: -Smooth – skeletal – cardiac muscles. -Nervous tissues: -Neuron and its types - Nerve fibres - Neuroglial cells.	**1**	**3**
	14 weeks	**42hrs**

2 Course components (total contact hours per semester):

Lecture : 42	**Tutorial:**	**Practical: 42**	**Other:**

3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week): 12h (reports & essay)

4. Development of Learning Outcomes in Domains of Learning

For each of the domains of learning shown below indicate:

- A brief summary of the knowledge or skill the course is intended to develop;
- A description of the teaching strategies to be used in the course to develop that knowledge or skill;
- The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

a. Knowledge : Description of the knowledge to be acquired

Upon successful completion of this course The student will be able to:

- **Student will be familiar with the general characters of plant cells.**
- **Student will be aware with the differences between plant and animal cells.**
- **Student will be familiar with protoplasmic and non protoplasmic contents of plant cell.**
- **Student will be familiar with the different types of plant tissues, their functions and distribution within plant body.**

1- Define the difference between prokaryotic and eukaryotic cells.
2- Describe the fine structure and functions of all living organelles.
3- Explain biological activities of the animal cells.
4- Detect the difference between animal tissues.
5- Explain the function of animal tissues.
6- Discuss the distribution of all animal tissues in the body organs.

(ii) Teaching strategies to be used to develop that knowledge

- The methodology includes a combination of lectures by the lecturer, seminar presentation by the students and web-interactions.
- At the end of the programme, students will be divided into groups for seminar presentation on important areas of the course to assess their understanding and comprehension of the course.
- All students will be involved in on-line learning process and each student is required to create an E-mail address to facilitate student web interactions.
- Using images and movies
- Encouraging students to collect the new information about what the new in Microbiology
- Enable the reference books and scientific sites concerning General biology in internet.

(iii) Methods of assessment of knowledge acquired:

- Periodical exam and reports 10%
- Mid- term theoretical exam 20%
- Mid-term practical exam 5%
- Final practical exam 15%
- Final exam 50%

b. Cognitive Skills

(i) Cognitive skills to be developed

Having successfully completed the course students should be able to:

Explain the structure and function of the plant and animal cells.
- **Understand the ultrastructure and function of living organelles.**
- **Follow some of the biological activities of the cell.**
- **List types of plant and animal tissues.**
- **Differentiate between plant and animal tissues.**
- **Explain specific characters of each tissues.**
- **Classify the plants and animal tissues**
- **The student will be able to detect the plant and animal tissues in the selected organs examined under the microscopic.**

(ii) Teaching strategies to be used to develop these cognitive skills:

- Lectures
-Brain storming
-Discussion

(iii) Methods of assessment of students cognitive skills

- Exam must contain questions that can measure these skills.
- Quiz and exams
- Discussions after the lecture

c. Interpersonal Skills and Responsibility

At the end of the course, the student will be able to:

Describe the structure of the cell
- **Explain most of the biological activities of the cell**
- **Make short presentation about the cell and the animal tissues.**

- Defined the desirable sections.

(i) **Teaching strategies to be used to develop these skills and abilities**

- Lab work
- Case Study
- Active learning
- Small group discussion

(iii) Methods for assessment of the students interpersonal skills and capacity to carry responsibility

- Evaluate the efforts of each student in preparing the report.
- Evaluate the scientific values of reports.
- Evaluate the work in team
- Evaluation of the role of each student in lab group assignment
- Evaluation of students presentations

d. Communication, Information Technology and Numerical Skills

(i) Description of the skills to be developed in this domain. At the end of the course, the student will be able to:

1. Enhancing the ability of students to use computers and internet.
2. Interpret biological data
3. Present biological data orally.
4. Know how to write a report.

5. Teaching strategies to be used to develop these skills

1. Homework (preparing a report on some topics related to the course depending on web sites).
2. Seminars presentation
3. Field visits to factories

(iii) Methods of assessment of students numerical and communication skills

1. Evaluation of presentations
2. Evaluation of reports
3. Practical exam

e. Psychomotor Skills (if applicable)

At the end of the course, the student will be able to:

- **Practice the basic Lab. Skills.**
- **Use light microscope in accuracy.**
- **Prepare microscopic slides.**

(ii) Teaching strategies to be used to develop these skills

- Follow up students the students in lab and during carryout all microbiological techniques

4. **Methods of assessment of students psychomotor skills**

- Giving additional marks for preparing correct media, bacterial slides , good seminar presentation
- Practical exam.

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Exercises & Home works	All weeks	5 %
2	Participation	All weeks	5 %
3	Written Test (1)	6th week	15%
4	Written Test (2)	11th week	15%
5	Final Exam (Practical)	15th week	20%
6	Final Exam (theoretical)	16th week	40%

D. Student Support

1. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)

Office hours: 10 hrs

E. Learning Resources

Required Text(s):

Reece et. al (2013) Campbell Biology 10th edition. Benjamin Cunnings.

Mauseth, J. (2008) Plant Anatomy. Blackburn Press

Wojciech Paulina (2015) Histology: a text and atlas. LWW

Recommended Reading List

Electronic Materials, Web Sites

Other learning material such as computer-based programs/CD, professional standards/regulations

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Lecture rooms, laboratories, etc.)

- Class room is already provided with data show
- The area of class room is suitable concerning the number of enrolled students (68) and air conditioned.

2. Computing resources

- Providing class rooms with computers and labs with data show.

3.Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

- Availability of some reference bacterial strains
- Availability different specific media and chemicals used for isolation.

G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching • Questionaries • Open discussion in the class room at the end of the lectures
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department • Revision of student answer paper by another staff member. • Analysis the grades of students.
3. Processes for Improvement of Teaching • Preparing the course as PPT. • Using scientific movies. • Coupling the theoretical part with laboratory part • Periodical revision of course content.
4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution) • After the agreement of Department and Faculty administrations
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. • Periodical revision by Quality Assurance Units in the Department and institution

Faculty member responsible for the course:

Prepared by faculty staff: 1.Botany / Zoology academic staff members 2.Khaled Elbanna	**Signature:**
Date Report Completed: **09/2015**	
Revised by: 1. Dr. Khaled Elbanna 2. Dr. Hussein H. Abulreesh 3. Dr. Shady Elshahawy	**Signature:**
Date: **1.10.2015**	

Program Chair Dr. Hussein H. Abulreesh	**Signature:**
Dean **Prof. Samir Natto**	**Signature:**
Date:	

- **مرفقات:**

نماذج من الاختبارات الدورية والنصفية والنهائية

Modified by: 10/2016	
Dr. Hanan Osman	**Signature:** حنان السيد محمد
Dr. Fatimah Al-Shehrei	**Signature:** 2016 Dr fatimah
Dr. Widad Al-Juhani	**Signature:**
Dr. Maha Al-Jabri	**Signature:**
Dr. Randa A. Elbassat	**Signature:** Randa A. Elbassat
Dr. Rasha Ali Ebiya	**Signature:** Rasha Ebiya
Dr. Doaa M. Shehata	**Signature:** Doaa Shehata

Kingdom of Saudi Arabia
National Commission for
Academic Accreditation &
Assessment

المملكة العربية السعودية
الهيئة الوطنية للتقويم
والاعتماد الأكاديمي

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

COURSE SPECIFICATION

Course title General Physics

Course code: 4031012-4

Revised 13 December 2015

Kingdom of Saudi Arabia
National Commission for
Academic Accreditation &
Assessment

المملكة العربية السعودية
الهيئة الوطنية للتقويم
والاعتماد الأكاديمي

Course Specification

For Guidance on the completion of this template, please refer to of Handbook 2 Internal Quality Assurance Arrangements

Institution: **UM AL – QURA UNIVERSITY**

College/Department : **Faculty of Applied Science – Department of Physics**

A Course Identification and General Information

1. **Course title** **General Physics**
2. **Course code:** **4031012-4**

2. **Credit hours:** **4hrs**

3. **Program(s) in which the course is offered. :** **BSc Physics**

4. **Name of faculty member responsible for the course:** **One of the academic staff member**

5. **Level/year at which this course is offered:** **1st Year / Level 2**

6. **Pre-requisites for this course (if any):**

7. **Co-requisites for this course (if any):** **---**

8. **Location if not on main campus:** **Main campus and Alzaher.**

B Objectives

After completing this course student should be able to:

1. Define the concepts of the measurements.
2. Define the concepts measuring length.
3. Define the concepts of measuring time.
4. Define the concepts of measuring weight.
5. Differentiate between the distance, the position, and the displacement.
6. Differentiate between the speed and the velocity.
7. Differentiate between the average velocity and the instantaneous velocity.
8. Define the concepts of the acceleration.
9. Differentiate between the average acceleration and the instantaneous acceleration.
10. Differentiate between the linear acceleration and the free fall acceleration.
11. Differentiate between the vectors and the scalars
12. Analyze the vectors into their components.
13. Calculate the multiplication of the vectors.
14. Define the concepts of the force.
15. Define the relation between the force and the acceleration.
16. Apply Newton’s laws of motion.
17. Differentiate between the Work and the Energy.
18. Differentiate between the Energy and the power.
19. Define the Kinetic energy of the body.
20. Define the concept of the density of the body.
21. Define the concept of the pressure within the fluid.
22. Define the concept of Pascal principle.
23. Define the concept of Archimedes’ principle.
24. Define the concept of Bernoulli’s Equation.
25. Define the concept of the temperature

26. Differentiate between the Celsius Scale and Fahrenheit scale of temperature.
27. Define the laws of reflection through plane mirrors and spherical mirrors.
28. Define the laws of refraction through thin lenses.
29. Apply the laws of thin lenses.

In addition to these items, the students should gain practical skills through performance some experimental class.

C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached):

The course will cover the principle of physics, such as measurements, work and energy, Newton's laws, heat, fluid mechanics, and light. This course will provide a conceptual and experimental background in physics sufficient to enable students to take courses that are more advanced in related fields.

1 Topics to be Covered

Topics	No of Weeks	Contact hours
❖ **Measurement** 1- The physical quantities, standards, and Units. 2- The international system of units. 3- The Standard of time 4- The Standard of length 5- The Standard of Mass 6- Precision and significant figures. 7- Dimensional analysis.	**1**	**3**
❖ **Vectors** 1- Vectors and Scalars. 2- Adding vectors : graphical methods 3- Components of vectors. 4- Adding vector: component method. 5- Multiplications of vectors. 6- Vector laws in physics.	**2**	**6**

❖ **Motion in one dimension** 1- Particles kinematics. 2- Description of motion 3- Average velocity 4- Instantaneous velocity. 5- Accelerated motion. 6- Motion with Constant Acceleration 7- Freely falling Bodies. 8- Measuring free fall acceleration.	**1**	**3**
❖ **Motion in two and three dimensions** 1- Position, velocity, and acceleration. 2- Motion with constant acceleration 3- Projectile motion 4- Uniform circular motion 5- Velocity and acceleration vectors in circular motion	**1**	**3**
❖ **Force and motion** 1- Position, velocity, and accelerations 2- Motion with constant acceleration. . 3- Newtons first and second laws. 4- Forces. 5- Newtons second law 6- Newton's third law. 7- Units of force 8- Weight and mass 9- Measuring forces 10- Applying Newton's laws.	**2**	**6**
❖ **Work and Energy** 1. Work done by constant force. 2. Work done by a variable force: one dimensional case. 3. Work done by a variable force: two dimensional case. 4. Kinetic energy and work-energy theory. 5. Power.	**1**	**3**

❖ **Fluids Statics** 1. Fluids and Solids 2. Density and pressure. 3. Variation of density in a fluid at rest. 4. Pascal Principle. 5. Archimedes' Principle. 6. Surface tension.	**1**	**3**
❖ **Fluid dynamics** 1. General concepts of fluid flow 2. Streamlines and the equation of continuity. 3. Bernoulli's Equation 4. Application of Bernoulli's Equation 5. Viscosity.	**1**	**3**
❖ **Temperature, Heat and the first law of Thermodynamics.** 1. Heat: Energy in transit 2. Heat capacity and specific heat. 3. Heat capacity of solids 4. Temperature. 5. The Celsius and Fahrenheit Scales. 6. Heat transfer.	**2**	**6**
❖ **Reflection and refraction of light at plane surface** 1. Reflection and Refraction 2. Deriving the law of refrlection 3. Image formation by plane mirrors. 4. Deriving the law of refraction. 5. Total internal reflection.	**1**	**3**
❖ **Reflection and refraction of light at plane surface** 1. Spherical mirrors 2. Spherical refracting surfaces. 3. Thin lenses 4. Compound optical systems 5. Optical instruments	**1**	**3**
❖ **Exercises and Solved problems**	**1**	**3**
	15 weeks	**45hrs**

2 Course components (total contact hours per semester):			
Lecture : 45	**Tutorial:**	**Practical: 42**	**Other:**

Practical part:

1. Safety and Security at the lab.
1. Introduction.
2. Precise measurements.
3. Vectors.
4. Determination of specific gravity.
5. Determination of Surface tension of a liquid.
6. Determination of viscosity of a liquid.
7. Determination of sound velocity in air.
8. Determination of refractive index of a Prism.
9. Determination of the melting point of wax.
10. Verification of lens formula.
11. Verification of mirrors formula.
12. Determination of specific heat.

3. Additional private study/learning hours expected for students per week. (This should be an average : for the semester not a specific requirement in each week):
6 Office hours to help students for solving assigned problems

4. Development of Learning Outcomes in Domains of Learning

For each of the domains of learning shown below indicate:

- A brief summary of the knowledge or skill the course is intended to develop;
- A description of the teaching strategies to be used in the course to develop that knowledge or skill;
- The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

a. Knowledge : Description of the knowledge to be acquired

Upon successful completion of this course The student will be able to:

1- Understanding the principle and concepts of physics.
2- Applying the physics law to different environmental situation.
3- Improving logical thinking.
4- Using mathematical formulation to describe the physical principle or phenomena
5- Ability to explain how things are working.
6- Teaching strategies to be used to develop that knowledge
7- Demonstrating the basic information and principles through lectures and the achieved applications
8- Discussing phenomena with illustrating pictures and diagrams
9- Lecturing method:
    a. Blackboard
    b. Power point
    c. e-learning
10- Tutorials
11- Revisit concepts
12- Discussions
13- Brain storming sessions
14- Start each chapter by general idea and the benefit of it;
15- Learn the student background of the subject;
16- Show the best ways to deal with problem;

17- Keep the question "why" or "how" to explain always there

Build a strategy to solve problem.

(ii) Teaching strategies to be used to develop that knowledge

- The methodology includes a combination of lectures by the lecturer, seminar presentation by the students and web-interactions. Students will be given opportunity to understand the role of important physics law in different applications.
- At the end of the programme, students will be divided into groups for seminar presentation on important areas of the course to assess their understanding and comprehension of the course.
- All students will be involved in on-line learning process and each student is required to create an E-mail address to facilitate student web interactions.
- Using images and movies
- Encouraging students to collect the new information about what the new in Physics.
- Enable the reference books and scientific sites concerning Physics in internet.

(iii) Methods of assessment of knowledge acquired:

- Solve some example during the lecture.
- Exams:
    - Quizzes
    - Short exams (mid term exams)
    - Long exams (final)
    - Homework.
    - Activities.
- Discussions with the students.
- Ask the student to clear the misunderstanding of some physical principle.
- Ask quality question.

b. Cognitive Skills

(i) Cognitive skills to be developed

Having successfully completed the course students should be able to:

1- Define the physical phenomena.
2- Apply the laws of physics.

3- Analyse the physical phenomena.
4- Express the physical phenomena mathematically.
5- Doing small researches

(ii) Teaching strategies to be used to develop these cognitive skills:

1- Preparing main outlines for teaching
2- Following some proofs
3- Define duties for each chapter
4- Home work assignments
5- Encourage the student to look for the information in different references
6- Ask the student to attend lectures for practice solving problem

(iii) Methods of assessment of students cognitive skills

1- Midterm's exam. Exams, short quizzes
2- Asking about physical laws previously taught
3- Writing reports on selected parts of the course
4- Discussions of how to simplify or analyze some phenomena

c. Interpersonal Skills and Responsibility

At the end of the course, the student will be able to:

- Work independently.
- The students learn independently and take up responsibility.

(i) Teaching strategies to be used to develop these skills and abilities

1- Search through the internet and use the library.
2- Lab work.
3- Case Study.
4- Small group discussion.
5- Enhance educational skills.
6- Develop their interest in Science through :(lab work, field trips, visits to

scientific and research.

7- Encourage the student to attend lectures regularly

8- Give students tasks of duties

(iii) Methods for assessment of the students interpersonal skills and capacity to carry responsibility

- Evaluate the efforts of each student in preparing the report.
- Evaluate the scientific values of reports.
- Evaluate the work in team
- Evaluation of the role of each student in lab group assignment
- Evaluation of students presentations

d. Communication, Information Technology and Numerical Skills

1. **Description of the skills to be developed in this domain. At the end of the course, the student will be able to:**

1. Enhancing the ability of students to use computers and internet.
2. Interpret Physical phenomena.
3. Present Physical phenomena orally.
4. Know how to write a report.
5. Computation
6. Problem solving
7. Data analysis and interpretation.
8. Feeling physical reality of results

2. **Teaching strategies to be used to develop these skills**

1. Homework (preparing a report on some topics related to the course depending on web sites).

2. Seminars presentation

3. Field visits

(iii) Methods of assessment of students numerical and communication skills

1. Evaluation of presentations

2. Evaluation of reports
3. Practical exam
4. Homework.
5. Final exams.
6. Research.

e. Psychomotor Skills (if applicable)

(ii) Teaching strategies to be used to develop these skills

- Follow up students the students in lab and during carryout all physical experiments.

4. **Methods of assessment of students psychomotor skills**

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Exercises & Home works	All weeks	10 %
2	Participation in activities lectures and labs	All weeks	10 %
3	Written Test (1)	6th week	10%
4	Written Test (2)	11th week	10%
5	Final Exam (Practical)	15th week	20%
6	Final Exam (theoretical)	16th week	40%

D. Student Support

1. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)

Each student will supervise by academic adviser in physics Department and the time table for academic advice were given to the student each semester.

E. Learning Resources

Required Text(s):

-

Physics, 4th edition , By: Halliday, Resnick, and Krane, Wiley (1992)

Recommended Reading List

University Physics with modern Physics, 13th edition, by: Hugh D. Young and Roger A. Freedman, Addison-Wesley, (2012).

Electronic Materials, Web Sites

(eg. www.youtube.com.)

Other learning material such as computer-based programs/CD, professional standards/regulations

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Lecture rooms, laboratories, etc.)

- Class room is already provided with data show
- The area of class room is suitable concerning the number of enrolled students (68) and air conditioned.
- Library
- Laboratory for fundamental of physics

2. Computing resources

- Computer room
- Scientific calculator.

3.Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

- .

G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Questionaries
- Open discussion in the class room at the end of the lectures

2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department

- Revision of student answer paper by another staff member.
- Analysis the grades of students.

3. Processes for Improvement of Teaching

- Preparing the course as PPT.
- Using scientific movies.
- Coupling the theoretical part with laboratory part
- Periodical revision of course content.

4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)

- After the agreement of Department and Faculty administrations

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- Periodical revision by Quality Assurance Units in the Department and institution

Date: 13 December 2015

Head of the Physics Department

Dr. Hatem Alamri

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specifications
(Calculus 1 4041101-4**)**

COURSE SPECIFICATIONS

Institution	Umm Al-Qura University
College/Department	Faculty of Applied Science/ Department of Mathematical Science

A. Course Identification and General Information

1. Course title and code: **Calculus(I)** (4041101-4)
2. Credit hours 4 Hours
3. Program(s) in which the course is offered.

BSc. Mathematics

(If general elective available in many programs indicate this rather than list programs)

4. Name of faculty member responsible for the course ****
5. Level/year at which this course is offered First year/first semester
6. Pre-requisites for this course (if any) Non
7. Co-requisites for this course (if any)
8. Location if not on main campus Al-Abdia Campus
9. Mode of Instruction (mark all that apply)

a. Traditional classroom	☑	What percentage?	100
b. Blended (traditional and online)	☐	What percentage?	
c. e-learning	☐	What percentage?	
d. Correspondence	☐	What percentage?	
f. Other	☐	What percentage?	

B Objectives

1. What is the main purpose for this course?

By the end of the course the students will be able to

- use the concepts of introductory calculus
-have concise and authoritative definitions of mathematical terms
-solve linear equations and inequalities
-solve quadratic equations and inequalities
-evaluate the limit of functions.
-find derivatives of functions using theorems and rules.
-extend the concept of limits to infinity.
-differentiate implicit and explicit functions .
-study a function :where it goes, how it evolves, studying its monotonicity and critical points, concavity and inflexion points
-integrate functions

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

1. Encouraging students to collect problems from web based reference material and supervise classroom discussions.
2. Update references used in teaching process.
3. Use e-learning facilities more efficiently.
4. Use computer packages for solving exercise

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact Hours
Real numbers, Exponents and Radicals, Polynomials: BasicOperations and Factoring . Solving Equations, Rational Expressions: Basic Operations, Inequalities, Absolute Values.	3	12
Definition of Functions(Domain and Range), Graphs of Functions, Operations on Functions, Trigonometric Functions and Identities	2	8
Introduction to Limits, Theorems on limits, Limit from Right and from Left, Definition of Continuity	2	8
Definition of Derivative (Using Limits), Rules and Theorems for Finding Derivatives, Derivative of Trigonometric Functions, Chain Rule, Higher Order Derivatives, Implicit Differentiation	3	12
Maxima and Minimam, Monotonicity, Local Maxima and Minimam, Concavity, Sketching the Graphs	2	8
Integration of Functions, Definite Integrals	2	8

2. Course components (total contact hours and credits per semester):

	Contact Hours				Self-Study	Other	Total
	Lecture	Tutorial	Laboratory	Practical			
Contact Hours	56	-	-	-	-	-	56
Credit	4						4

3. Additional private study/learning hours expected for students per week.	4 Hours

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Define the related basic scientific facts, concepts, principles and techniques calculus	Lectures Tutorials Discussion Problem Solving	Exams Home work.
1.2	Recognize the relevant theories and their applications in basic mathematics.		
2.0	**Cognitive Skills**		
2.1	Representing problems mathematically.	Lectures Tutorials Solve Problem	Exams Quizzes. Homework.

2.2	How to distinguish different rules in calculus.	Brain Storming	Discussion
3.0	**Interpersonal Skills & Responsibility**		
3.1	Develop connections of calculus with other disciplines	Cooperative education Competitive education	Home work. Reports. Quizzes. Discussion
	Solve problems using a range of formats and approaches in basic science		
3.2	show the ability to work independently and within groups.		
4.0	**Communication, Information Technology, Numerical**		
4.1	Learn how to summarize lectures or to collect materials of the course.	Lectures tutorials brain storming	Home work. Reports. Discussion
4.2	Learn how to solve difficulties in learning: solving problems – enhance educational skills		
5.0	**Psychomotor**		
Not applicable			

5. Schedule of Assessment Tasks for Students During the Semester			
No.	Assessment task	Week due	Proportion of Final Assessment
1	Midterm 1	6th week	15 %
2	Midterm 2	12th week	15%
3	Homework + reports + Quizzes	During semester	20%
4	Final exam	End of semester	50 %

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

1- Office hours per week in the lecturer schedule (6 hours per week).
2- Contact with students by e-mail,SMS, and e-learning facilities.

E. Learning Resources

1. Required Text(s)

Mathematics for preparatory year program, Book1, Oxford University Press,2013

2. Essential References

Calculus (Ninth Edition)by Dale Varberg, Edwin Purcell and Steven Rigdon

3. Recommended Books and Reference Material (Journals, Reports, etc) (Attach List):

4.Electronic Materials, Web Sites etc
http://en.wikipedia.org/wiki/Calculus

5. Other learning material such as computer-based programs/CD, professional standards/regulations: Maple

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Lecture rooms, laboratories, etc.)
-Classroom with capacity of 25-students.
- Library.

2. Computing resources: Not available

3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list): None

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching:

- Student feedback through electronic facilities organized by the deanship of registration and acceptance.

2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department

- Evaluation of the teachers by internal & external faculty members.
- Visiting to the classrooms.
- Mutual visits between colleagues and giving advices to each other after each lecture

3 Processes for Improvement of Teaching

- Analysis of student course evaluation and feedback
- Peer evaluation and feedback
- Review of course portfolios
- Workshops on pedagogical methods

4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- Analysis of course assessments by other reviewers on a periodic basis.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- Material and learning outcomes are periodically reviewed internally and externally.
- Comparing course content and teaching methodologies with similar courses offered at other departments and universities.
- Studying the outcomes of the students' evaluations of the course and use it to improve teaching strategies.

Faculty or Teaching Staff: ____
Signature: ____________________ Date Report Completed: ________________
Received by: ________________________ Dean/Department Head
Signature: __________________________ Date__________

Umm Al-Qura University
English Language Center

English Language for Applied Sciences

1. Basic Information

1. COURSE: **English Language**	2. COURSE NUMBER: **7004101-4**
3. Course Required ☒ Elective ☐	4. Number of Credits: **4**
6. COURSE PREREQUISITES: **None**	5. Number of Contact Hours: 10 h a week for a total of 160h/semester
7. Resource Book: ***Milestones in English A1 and A2***	
7. COURSE TIME: First Year 1st Semester	

2. English Language ٧٠٠٤١٠١-٤ اللغة الإنجليزية

Course Description

English Language 705101-4 is an English for General Purposes (EGP) course that develops the language skills needed for academic study in English by teaching essential vocabulary, preparing students for speaking and building basic academic writing skills. As such, it is a pre-requisite for the ESP courses offered by the ELC. All classes are held in language labs.

At the end of the first semester, successful students are expected to be at the beginning of the intermediate level of English, ready to take their course in English for Specific Purposes (ESP).

Students are evaluated as follows:

1. Active participation, attendance, on time submission of finished assignments: 20%

2. Midterm Exam: 30%

3. Final Exam: 50%

3. English Language (for Applied Sciences) ٧٠٠٤١٠١-٤ اللغة الإنجليزية

Course Delivery Plan

Course Delivery Plan

Coverage of Planned Program

Weekly Instruction: 10 hours; Total: Semester Instruction: 160 hrs

Number of Textbooks: 2

Milestones in English: Student's Book with Online Skills A1

Milestones in English: Student's Book with Online Skills A2

Week No.	Unit / topic*	Planned Hours
Textbook: Milestones in English A1		
Week 1	Introduction to the course Material familiarization, etc.	**10**
Week 2	Unit 1: Introductions	**10**
Week 3	Unit 2: People and places	**10**
Week 4	Unit 3: Family and things	**10**
Week 5	Unit 4: Food around the world	**10**
Week 6	Unit 5: Free time	**10**
Week 7	Unit 6: Daily life	**10**
Week 8	Unit 7: The world around us	**10**
Week 8: Wednesday & Thursday: Midterm Exam		
Week 9	Unit 8: Life in the past	**10**
Week 10	Unit 9: Famous people	**10**
Week 11	Unit 10: Plans	**10**
Textbook: Milestones in English A2		
Week 12	Unit 1: Your world	**10**
Week 13	Unit 2: My day	**10**
Week 14	Unit 3: Work	**10**
Week 15	Unit 4: Places	**10**
Week 16	Unit 5: Retail	**10**
Week 16: Wednesday & Thursday: Midterm Exam		

Umm Al-Qura University
English Language Center

English Language for Applied Sciences

1. Basic Information

1. COURSE: English Language for Applied Sciences اللغة الإنجليزية للعلوم التطبيقية	2. COURSE NUMBER: **7004102-4**
3. Course Required ■ Elective ☐	4. Number of Credits: **4**
6. COURSE PREREQUISITES: **English Language 7004101-4**	5. Number of Contact Hours: 10 h a week for a total of 160h/semester
7. COURSE TIME: First Year 2nd Semester	

2. English Language for Applied Sciences

اللغة الإنجليزية التطبيقية

Course Description

English Language for Applied Sciences is a course designed for the students of the College of Applied Sciences covering a variety of technical themes. The course exposes the students to authentic samples of technical English in both oral and written forms. Following an integrated approach, the course exploits the technical English samples for introducing lexical items and grammatical structures that are necessary for the day-to-day communicative functions required of students of Applied Sciences. Drawing on authentic source materials, the course offers a wide range of independent and group activities the purpose of which is to familiarize students in a gradual manner with various aspects of technical English. A number of practice and productive exercises are included to help students master the four language skills.The course contents are suitably and amply supplemented with visual aids and authentic audio content on CD. After successful completion of the course students are expected to understand a variety of technical and scientific texts, use technical vocabulary and develop a modest ability to produce texts.

Students are evaluated as follows:

1. Active participation, attendance, on time submission of finished assignments: 20%
2. Midterm Exam: 30%
3. Final Exam: 50%

3. English Language for Applied Sciences: Course Delivery Plan

Coverage of Planned Program

Weekly Instruction: 10 hours; Total: Semester Instruction: 160 hrs

Number of Textbooks: 1 (Technical English by Terry Phillips)

Week No.	Unit / topic*	Planned Hours
Week 1	An introduction to the course Points and Lines	**10**
Week 2	Fractions and Ordinals Arithmetic	**10**
Week 3	Surfaces and angles Spaces and Volumes	**10**
Week 4	Measuring Algebra and Formulas	**10**
Week 5	Natural or Man-made	**10**
Week 6	Bits and Bytes	**10**
Week 7	Computer Networking	**10**
Week 8	Elements and Compounds	**10**
Week 8: Last meeting: Midterm Exam		
Week 9	States of Matter Properties of Matter	**10**
Week 10	Symbols and Keys Structures and Plans	**10**
Week 11	Forces, Loads and Tools	**10**
Week 12	Energy and Motion	**10**
Week 13	Cells, Organs and Systems	**10**
Week 14	Chains, Webs and Cycles	**10**
Week 15	Micro-machines and ICT	**10**
Week 16	Electricity and Magnetism	**10**
Week 16: Last meeting: Final Exam		

Arabic Language (501101-2)

Topics list:

*The parts of speech : nouns,verbs,and particles with shewing the grammatical state of each - (mabni and mo’rab) of nouns and verbs

(it means experiencing grammatical states or not)

*Syntax- definition of (Irab) syntactic analysis, its kinds, and signs (main and other)

* analyzing with subsidary signals *

* The fine nouns, analysis, conditions or rules of analyzing with (particles) - (dual) and (Masculine sound plural) – analyzing what is pluralized with (أ) and (ت)

*analyzing (uninflected words) , knowing (when) it can be inflected or not ?

The five verbs.

*Morphological balance (الميزان الصرفي) – abstract and derivated – knowing how to look up the new word in the dictionary.

* A study of AL-Hujurat until ⇨ verse 12

A study of the farewell speech of………. And some of the poems. Prophet Mohammad (peace be upon him)

Islamic Culture I (601101-2)

Topics to be covered in this course:

(1)- Introduction to Islamic Culture

(2)- Introduction to the study of Creed

(3)- Faith in God (Believe in the existence of God – The unification of Godliness)

(4)- Faith in God (The unification of Divinity – the unification of names and attributes)

(5)- Faith in Angels and Heavenly Books

(6)- Faith and believe in the Messengers of God peace be upon them

(7)- Faith on the Day of Resurrection (1)

(8)- Faith on the Day of Resurrection (2)

(9)- Faith in Destiny

(10)- Worship in Islam (1)

(11)- Worship in Islam (2)

(12)- Ethics in Islam (1)

(13)- Ethics in Islam (2)

Islamic Culture II (601201-2)

Topics to be covered in this course

(1)- The Holy Quran – its documentation and recitation

(2)- Maximize the holiness of the Quran

(3)- Interpretation of

(4)- The interpretation of Surat Al-Hujurat (the Chambers), the 49th Sura of the Quran (Chapter 26) Part one – This Sura contains: etiquette and norms to be observed in the Muslim community, including the proper conduct towards the prophet, an injunction against acting on news without verification, a call for peace and reconciliation, as well injunctions against defamation, suspicion, and backbiting. The Sura also declares a universal brotherhood among Muslims. The thirteenth verse, one of the most famous in the Quran, is understood by Muslim scholars to establish equality with regards to race and origin; only God can determine one's nobility based on his piety.

(5)- The interpretation of Surat Al-Hujurat (the Chambers), the 49th Sura of the Quran (Chapter 26) Part two

(6)- The status and importance of the Prophetic Sunnah

(7)- The care of Muslims in Prophetic Sunnah

(8)- The duty of Muslims towards the Messenger of God

(9)- Explanations of Prophet Hadiths (Prophet saying) 1

(10)- Explanations of Prophet Hadiths (Prophet saying) 2

(11)- Explanations of Prophet Hadiths (Prophet saying) 3

(12)- Explanations of Prophet Hadiths (Prophet saying) 4

(13)- Explanations of Prophet Hadiths (Prophet saying) 5

Islamic Culture III (601301-3)

Topics to be covered in this course:

(1)- Introduction to the study of Systems in Islam

(2)- Family system in Islam

(3)- The stages of family formation in Islam

(4)- Rights and duties among family members in Islam

(5)- Methods of settling disputes in Islam

(6)- Economic system in Islam (1)

(7)- Economic system in Islam

(8)- Political system in Islam (1)

(9)- Political system in Islam (2)

(10)- Political system in Islam (3)

(11)- The penal system in Islam

(12)- Human rights in Islam

(13)- Human rights in Islam

Islamic Culture IV (601401-2)

Topics to be covered

(1)- Muslim society between idealism and deviation (13 cases) – to be covered in 7 weeks

(2)- The situation of the contemporary Muslim society and the reasons for its advancement (10 cases) to be covered in 6 weeks

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The Biography of the Prophet Mohammad Peace be upon Him (102101-2)

Topics to be covered in this course

The prophet Mohammad from His berth to His mission

(1)- Prophet’s attribution

(2)- Prophet mission

(3)- The mission: Mecca period

(4)- The mission: Madinah period

(5)- The spread of Islamic call

(6)- The death of the prophet Mohammad peace be upon him

The Biography of the Prophet Mohammad Peace be upon Him (102101-2)

Topics to be covered in this course

The prophet Mohammad from His berth to His mission

(1)- Prophet’s attribution

(2)- Prophet mission

(3)- The mission: Mecca period

(4)- The mission: Madinah period

(5)- The spread of Islamic call

(6)- The death of the prophet Mohammad peace be upon him