Kingdom of Saudi Arabia

The National Commission for

Academic Accreditation & Assessment

Course Specifications

Qualitative Analytical Chemistry

402113-2

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 402113-2
2. Credit hours : 2 hrs.
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 Elghalban
5. Level/year at which this course is offered : 02nd level/1st year
6. Pre-requisites for this course (if any) : General Chemistry (1) 402101-3
7. Co-requisites for this course (if any)
8. Location if not on main campus : **both in El-Abdyah(boys side) and El-Zaher (girls side)**
9. Mode of Instruction (mark all that apply)

a. Traditional classroom	■	What percentage?	60
b. Blended (traditional and online)		What percentage?	
c. e-learning	■	What percentage?	10
d. Correspondence		What percentage?	
f. Other	■	What percentage?	30

Comments:

30 % for the practical part

B Objectives

1. What is the main purpose for this course? By the end of this course student will be able to 1- recognize the fundamentals of qualitative analysis. 2-Diffentiate between different types of chemical analysis. 3-.Develop the practical skills in detection of inorganic chemical compounds. 4- Identify the meaning of buffer solutions and buffer action . 5- Classify various aqueous solution equilibria. 6- Calculate the equilibrium constant for various aqueous solution ionic reactions. 7- Differentiate between different types of solutions. 8- Demonstrate an understanding of factors that affect solubility of slightly soluble salts. 9- Describe and explain factors that affect solubility. 10- Calculate concentrations of solutions using various units of concentration. 11- Identify a coordination compound.
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)	1	1
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 formation in qualitative analysis	1	1
Oxidation reduction equilibrium	2	2
General revision and preparatory exam	1	1
Practical ▪ 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		

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

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	15	-	-	14		29
Credit	1	-	-	1		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 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	List the different methods to express concentration		
1.4	Identify chemical , kinetic equilibrium and acid base equilibrium		
1.5	Know Colloidal solutions and conditions of ideal precipitation		
1.6	Recognize ionic and nonionic compounds, electrolytic and non electrolytic		
1.7	Recognize Coordination complexes, its structure and types of bonds in ionic complexes		
1.8	Mention the importance of complex formation as application in qualitative analysis		
1.9	Illustrate Oxidation reduction equilibrium		
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 expression concentration		
2.4	Design the different methods to determine the rate of chemical reactions		
2.5	Create 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	Take the personality and responsibility for their own learning	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	Working effectively in groups and exercise leadership when appropriate		
	Act ethically and consistently with high molar standards in personal and public fourms		

2016

	Community linked thinking		
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	Report, Quizes or team project	-	10%
2	Mid term exam	8	20%
3	Practical	14	30%
4	Final exam	Final term	40%

2016

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
V.N.Alexeyev,Qualitative Chemical Analysis ,CBSPublishera and Distributors ,Moscow 1994
2-R.K.McAlpine and B.A.Soule,Fundamental of Qualitative Chemical Analysis Semimicro Method,D Van Nostrand Comp. New York 1996
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 Elghalban

Signature: _____ Date Report Completed: _____

Received by: Dr Hatem Altass Department Head

Signature: _____ Date: _____