Kingdom of Saudi Arabia

The National Commission for

Academic Accreditation & Assessment

Course Specifications

Selected Topics in Analytical Chemistry

402413-2

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: **Selected Topics in Analytical Chemistry / 402413-2**
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: **8th level/4th year**
6. Pre-requisites for this course (if any): **Separation methods and thermal analysis course / 402317**
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?	**80%**
b. **Blended (traditional and online)**	■	What percentage?	**20%**
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- Able to apply different analytical methods on samples in artificial chemistry,** **2- Familiar with Quality control and environmental pollutions** **3- Able to using of statistical analysis in analytical chemistry 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. Quality control and data handling in analytical chemistry techniques and how to select the optimum samples	1	2
b. The methods and ways of analytical chemistry – environmental analytical chemistry – industrial pollutions	1	2
c. The analytical chemistry in manufactures – the measurements and primary standard materials and standard methods in analytical chemistry	1	2
d. The standard parameters in the world and in Saudi Arabia	1	2
e. The advanced analytical techniques	1	2
f. Using of statistical analysis in analytical chemistry and tests of significance	1	2
g. The optimal parameters to select the best analytical methods	1	2
h. The analytical problems during the solubility process and preparation of sample	1	2
i. Selective industrial applications	1	2
j. Forensic science and analytical chemistry in criminal and toxics examinations	1	2
k. Biological applications on hair, natural and artificial fibers, pesticides and environmental pollutions	1	2
l. Analytical applications on alloys, metals, raw material, rocks and sand	1	2

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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 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	Know the methods and ways of analytical chemistry – environmental analytical chemistry – industrial pollutions		
1.3	Describe analytical chemistry in manufactures – the measurements and primary standard materials and standard methods in analytical chemistry		
1.4	Familiar with the standard parameters in the world and in Saudi Arabia		
1.5	Select the optimal parameters to select the best analytical methods		
1.6	Identify the analytical problems during the solubility process and preparation of sample		
1.7	Write selective industrial applications		
1.8	Recognize forensic science and analytical chemistry in criminal and toxics examinations		
1.9	Outline biological applications on hair, natural and artificial fibers, pesticides and environmental pollutions		
2.0	**Cognitive Skills**		
2.1	Apply the optimal parameters to select the best analytical methods	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • posters • demonstrations
2.2	Compare between quality control and data handling in analytical chemistry techniques and how to select the optimum samples		
2.3	Explain the methods and ways of analytical chemistry – environmental analytical chemistry – industrial		

	pollutions		
2.4	Analyze the standard parameters in the world and in Saudi Arabia		
2.5	Summarize the selective industrial applications		
2.6	Account for analytical applications on alloys, metals, raw material, rocks and sand		
3.0	**Interpersonal Skills & Responsibility**		
3.1	Modify the methods and ways of analytical chemistry	• Lectures • Scientific discussion • Web-based study	• Exams • web-based student performance systems
3.2	Analyze The optimal parameters to select the best analytical methods		
4.0	**Communication, Information Technology, Numerical**		
4.1	Illustrate the using of statistical analysis in analytical chemistry and tests of significance	• Lectures • Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
4.2	Evaluate the optimal parameters to select the best analytical methods		
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	Exam	5-14	20%
2	Assignments		20%
3	Final Exam	16	60%

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)
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)
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 A. Kassem**

Signature:  **Date Report Completed: 2015**

Received by: Dr Hatem Altass **Department Head**

Signature: _____ **Date: _____**