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: **2017**
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
Electrolytic 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	• Exams • web-based student
2.2	Examples given in the lecture and exercise under the		

	supervision of teaching workshops.	• Library visits • Web-based study	performance systems • portfolios • posters • demonstrations
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

2-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: 12/1/2019**

Received by: Dr. Ismail Althagafi Department Head

Signature: **Date: 20/1/2019**