



Department ofFood Technology

College of ...Agriculture

University ofSalahaddin

Subject: ...Physical Chemistry

Course Outline– *Second year 1st semester*

Lecturer's name Assist.Prof.Dr. Safea Sabir Taha (PhD)

Academic Year: 2017/2018

Course Book

1. Course name	Physical chemistry
2. Lecturer in charge	Assist.Prof. Dr. Safea Sabir Taha
3. Department/ College	Food Technology/ Agriculture
4. Contact	e-mail: Safea.Taha@su.edu.krd Tel: (optional)
5. Time (in hours) per week	Theory: 2 Practice : 6
6. Office hours	Availability of the lecturer to the student during the week 6
7. Course code	

8. Teacher's academic profile

PROFESSIONAL EXPERIENCES

* 1- B. Sc. In Biochemistry science – Univer.of Baghdad in 1975.

2- M. Sc. In Organic Chemistry science – Univer. of Salahhadin in 2001.

Thesis title (*Synthesis and Spectroscopic Studies of some Coumarin -3-Carboxylic Acid Compounds by Ultrasonic Promoted Knoevenagel Reaction*)

3- Ph. D. In Petroleum Chemistry science – Univer. of Salahadin in 2007

Thesis title (*Evaluation of Crude Oil and its Products of Tawke Well in Zakho-Kurdistan Region and Gasoline Octane Number Improvement by Some Additives*)

Undergraduate Students

1. Organic Chemistry
2. Biochemistry
3. Physical Chemistry
4. Inorganic chemistry
5. Analytic chemistry

Postgraduate Students

1. Food Physics
2. Food pigments
3. Bio polymer

Sciential degrees

- 1- Scientific Researcher
- 2- Assistant Lecturer 2003-2007
- 3- Lecturer 2007-2012
- 4- Assistant Professor 2012 till now

Scientific and Office works

There isn't any office work

Supervised and Researches

* Published more than 5 scientific researches in several scientific Journals

* Supervised on 1 master thesis and 1 Diploma Thesis in industrial chemistry.

*Contributed as a member or supervisor for 6 examination committee for discussion master and two Ph.D. thesis.

* Supervised on more than 18 research projects at the end stage of undergraduate student.

The Conferences Contrib

1. The first international scientific conference of Cihan University – Erbil, May, 20-21, 2014.

2. The 5th international scientific conference of Eshik university – Erbil April 13-14, 2014

3. 2nd Scientific conference of garmian university 6,7 -2015

Periods

1-Preperation period for assistant Lab., Msc students & Msc teachers chemists deals with the **chemical Safety & security** in Agriculture College for all Depts in Salahadin Univer. 15/9/2012.

2- Preperation period for assistant Lab., Msc students & Msc teachers chemists deals with the **chemical Safety & security** in Agriculture College for all Depts in Salahadin Univer. 15/9/2014.

Committees

1- Contributed as a member of elevation scientific degree committee in college of

	<p>Agriculture departs/Univer. of Salahadin- Hawler to determine scientific grade in no.352 at10/11/2014.</p> <p>2- Contributed as a member of elevation scientific degree committee in college of Agriculture departs/Univer. of Salahadin- Hawler to determine scientific grade in no.4452 at14/12/2015. .</p> <p>3-Head of chemical consolidation committee in college of Agriculture departs./Univer. of Salahadin-Hawler since 2013.</p> <p>4-Member of scientific committee depart. of Food Technolog/college of Agriculture/Univer. of Salahadin-Hawler from 2009-2014.</p> <p>9. Member of Higher Education committee depart. Of Food Technolog / college of Agriculture/Univer. of Salahadin- Hawler since 2009.</p>
<p>9. Keywords</p>	<p>This course is a natural continuation of a course in physical chemistry, but the material is more focused. The basic goal is to establish a connection between different variable V,P, T through their of P&T effects inequalities and feasible region. Some topics are gas laws,physical processes of foods preservation,liquid properties & their relation with temperatur, also some knowledge about types of solutions, effects of solutes onB.P, F.P, P_{vap} & osmosis.....</p>
<p>10.</p>	<p>The more general objective of this course is to continue providing a deeper understanding and working knowledge of physical chemistry, while in the process strengthening analytical skills increasing student's ability to</p>

communicate effects of temperature & pressure on material states and their relation with volume of gases, making them comfortable with reading and understanding different physical properties of liquid substances & solutions on their own and continuing to develop their appreciation for abstract physical chemistry.

11. Course objective:

The topics listed in the syllabi will be covered in the lectures. The students will be asked to study all topics in the lectures at home. To get the best of the course it is suggested that the students attend classes as much as possible. Lectures note, are for supporting not for submitting the reading material try as much as possible to participate in classroom preparing the assignments given in the course.

12. Student's obligation:

Students role is very crucial in this course. They need to spend some time in solving and understanding the main concepts.

13. Forms of teaching

We will use datashow & the board in this course. The board is an old fashioned method of teaching and solving problems, and followed in most with the interpretation of correlation between variables T,P,V & Z &.... of well known universities.

14. Assessment scheme

1. Two tests (2 x 3%). 2% for active participation and attendance. for 20% of the term mark the annual striving in 25% theory .
2. Final examination 60% (40% theory & 20% practice).
3. If the student couldn't secure a minimum of 50% for the term and final examination to pass the course, they are given a chance to repeat the final examination in September.

15. Student learning outcome:

The students will learn some concepts in this new field of physical chemistry. It will be useful once the pursue a postgraduate degree

16. Course Reading List and References:

1-Principle of physical chemistry Hamil and Williamsm, Pretice-hall, Inc. (1959).

2-Atkins physical chemistry

book	
,(2009)	
3-Thomas Engel,Philip Reid, physical chemistry ,2 nd edition ,ISBN13 , (2009).	
4-Donald A. ,McQuame ,John D. Simon, Physical Chemistry (1998).	
17. The Topics:	Lecturer's name
In this section the lecturer shall write titles of all topics he/she is going to give during the term. This also includes a brief description of the objectives of each topic, date and time of the lecture Each term should include not less than 16 weeks	Lecturer's name 3 hrs.
18. Practical Topics (If there is any)	
In this section The lecturer shall write titles of all practical topics he/she is going to give during the term. This also includes a brief description of the objectives of each topic, date and time of the lecture	Lecturer's name 3-4 hrs
19. Examinations: The exams will be a combination of solving problems and explaining certain ideas of the course <ul style="list-style-type: none"> • Quizzes 5%. • Examinations will be given, 20%. • Final exam 60%. 	
20. Extra notes: None	
21. Peer review ول ھه و پيداچوونه	

Syllabus:**Week1:**

1-Introduction 2-Definition of physical chemistry.

3- Some of the principal subdivisions of physical chemistry

4-Usage & the role of physical chemistry in food technology & other different fields.

.Week2:

1-Gas states 2-Gas laws. 3-Boyles law , Charles law & Gay lausacs law

4-General gas laws

Week3:

.1- Graham's law of diffusion. 2-Liquification of gases & Critical costants

3- Critical pressure. 4- Critical temperature, Critical point, Critical state

5-Isotherm & molare volume.

Week4: 1-Ideal & real gases. 2-Critical pressure & tempreture. 3-Homological state law with

Examples 4-Liquid state: its properties 5-Types of electrostatic forces between molecules

Week5:

1-Equilibrium vapour pressures & effects of temperature & intermolecular forces on it.

2-Clausius clapeyron equation with the problems & its applications.

Week6:

1- Methods for the determination of vapour pressure of liquids.

2-The most characteristics of liquids 3-Some important points related to boiling points with problems.

Week7:

1-Triple point with phase diagram explanation. 2-Heat of vaporization & freezing point with the factors affecting on them. 4-Surface tension & the molecular basis of it.

Week8:

1- Definiton of Surface tension ,its measurement by using its equations with problems.

2-Methods of measuring Surface tension 3-Factors affecting on Surface tension.

3-Surfactants with examples.

Week9:

1-Capillarity the process occurring. 2-Viscosity 3-Liquid viscosity 4-Units of viscosity 5-Factors affecting on viscosity like temperature & their mathematical relationship with applications

Week10:

1-Types of viscosity 2-Fluidity & its relation with dynamic viscosity , problems

Week11:

1-Solution 2-Classification of solution according to solvents

3-Properties of solution 4-Ideal & real solution 5-Collegative properties of solution with the mathematical equations & problems. 6-Specific properties of ideal solution.

7-Application using Raoult's law with problems.

Week12:

1-Boiling point elevation with mathematical relationship

2-Freezing point depression with mathematical relationship.

3-Osmotic pressure its relation with the concentration of the solution & temperature , with mathematical relationship & application in food technology. 4-Types of membrane. 5-Types of solution. 6-Solubility

Week 13: 1-Factor affecting on solubility.

Week 14: Concentration of solution & their types.

Week 15: Examination + discussion

Some types of questions on Physical chemistry

Q\Fill the blank with the suitable item or phrases:

- 1.-----,-----& -----are the principal subdivision of physical chemistry.
2. Dehydration of foods will prevent----- reactions and growth of-----, while salting decrease-
. -----of-----
3. ----- Law states that the volume of a gas directly proportional to its absolute temperature at constant pressure.
5. The value of compressibility factor is = -----for all gases at pressure equal to zero.
- 6- -----,-----,-----are methods for the determination of vapor pressure.

Q2\A. Define: Intramolecular forces , Critical point , equilibrium vapor pressure

- B. If the vapor pressure of methyl ether is (115)torr at (34.9 C) ,if ΔH_{vap} of this ether is . 40.5KJ/mol calculate the temperature in °C when the vapor pressure is 1atm ?

