

Course E-Syllabus

1	Course title	General chemistry (2)
2	Course number	5502102
3	Credit hours	3
	Contact hours (theory, practical)	3,3
4	Prerequisites/corequisites	5502101
5	Program title	Bachelor Program in Biological sciences
6	Program code	
7	Awarding institution	Jordan university
8	School	Basic and Marine Sciences
9	Department	Biological sciences
10	Level of course	First year
11	Year of study and semester (s)	2019-2020 second semester
12	Final Qualification	Bachelor
13	Other department (s) involved in teaching the course	
14	Language of Instruction	English
15	Teaching methodology	<input type="checkbox"/> Blended <input checked="" type="checkbox"/> Online
16	Electronic platform(s)	<input checked="" type="checkbox"/> Moodle <input checked="" type="checkbox"/> Microsoft Teams <input type="checkbox"/> Skype <input checked="" type="checkbox"/> Zoom <input type="checkbox"/> Others...facebook.....
17	Date of production/revision	

18 Course Coordinator:

Name: Rana Al-Momani
Office number: 345
Phone number: 032090450-25076
Email: r_almomani@ju.edu.jo

19 Other instructors:

Name:
Office number:
Phone number:
Email:

Name:
Office number:
Phone number:
Email:

20 Course Description:

As stated in the approved study plan.

In this course we will cover Intermolecular Forces and Liquids and Solids, Physical Properties of Solutions, Chemical Kinetics, Chemical Equilibrium, Acids and Bases, Acid-Base, Equilibria and Solubility Equilibria, Thermodynamics, Redox Reactions and Electrochemistry

21 Course aims and outcomes:

A- Aims:

The aim of this class is to provide the basic concepts of chemistry that will be the bases for further education in chemistry and in other fields of science. In this class, the students will learn major concepts of chemistry, which will include intermolecular forces, physical properties of solutions, chemical kinetics, chemical equilibrium, acids and bases, Acid-Base Equilibria and Solubility Equilibria, laws of thermodynamics, and the properties of acids and bases, thermodynamics, Redox Reactions and Electrochemistry

B- Intended Learning Outcomes (ILOs):

Upon successful completion of this course students will be able to ...

1. To understand the nature of intermolecular forces.
2. To determine the type of intermolecular interactions
3. To understand the relative strength of the intermolecular interactions .
4. To understand the connection between the intermolecular forces and the bulk physical properties such as boiling point, freezing point, solubility, surface tension, heat of vaporization and viscosity.
5. To understand the physical changes (melting, vaporization, sublimation...etc)
6. To understand critical temperatures and pressures.
7. To understand the phase diagram and the triple point.
8. To understand different types of solution
9. To understand the solution process and relate it to the intermolecular forces and heat of solution.
10. Calculate concentrations (molality, molarity, and mass percent)
11. Convert between different concentration units
12. Determine the effect of temperature on solubility of solids in liquids and gases in liquids.
13. Determine the effect of pressure on solubility of gases in liquid by applying Henry's law.
14. To determine whether a property is a colligative property or not.
15. To calculate the vapor pressure lowering due to dissolving non-volatile solute in a volatile solvent.
16. To calculate the boiling point elevation and relate it to the vapour lowering.
17. To calculate the freezing point depression
18. To calculate the osmotic pressure.
19. To calculate the total vapour pressure mixing two miscible liquids.
20. To determine molar masses of unknown compounds using the colligative properties
21. Calculate the boiling point elevation, freezing point depression and osmotic pressure of electrolyte solutions.
22. To calculate the rate of a chemical reaction
23. Writing rate law and determining order of the reaction using initial rate method.
24. Underrating of the effect of temperature on the reaction rate qualitatively and quantitatively using Arrhenius equation. The student should be able to calculate activation energy.
25. Understanding the concept of reaction mechanism and relate it to the law.
26. Understanding the concept of catalysis and relate the concept to the activation energy.
27. Understand the concept of the equilibrium and write the equilibrium concept expression.
28. To express equilibrium constants in homogeneous equilibria and heterogeneous equilibria.
29. Predict direction of the reaction using the equilibrium constant and calculating the equilibrium concentrations.
30. To understand the factors that affect the chemical equilibrium (Le Châtelier's principle). This includes effect of changes in concentration, changes temperature, changes in volume, and changes in pressure , and the effect of the catalyst .
31. Understand Bronsted acid and base definition and to determine acid-base conjugate pairs.
32. Understand the acid –base propertoes of water.
33. To use PH of the solution as measure of the acidity of the solution
34. Understand the concept of the strength of acids and bases
35. Calculate the percent ionization using the acid ionization constant
36. Categorize acids as monoprotic, diprotic and triprotic
37. Understand the base ionization constant
38. Understand the relation between the acid-base ionization constants
39. Understand the acid base properties of salts.
40. Understand the acidity of the oxides

22. Topic Outline and Schedule:

Week	Lecture	Topic	Teaching Methods*/platform	Evaluation Methods**	References
1	1.1	Intermolecular Forces and Liquids and Solids	Synchronous lecturing		General Chemistry, by R. Change. Fifth Edition
	1.2				
	1.3				
2	2.1	Intermolecular Forces and Liquids and Solids	Synchronous lecturing		
	2.2				
	2.3				
3	3.1	physical properties of solution	Synchronous lecturing		
	3.2				
	3.3				
4	4.1	physical properties of solution	Synchronous lecturing		
	4.2				
	4.3				
5	5.1	chemical kinetics	Synchronous lecturing		
	5.2				
	5.3				
6	6.1	chemical kinetics	Synchronous lecturing	Homework	
	6.2				
	6.3				
7	7.1	chemical equilibrium	Synchronous lecturing	Homework	
	7.2				
	7.3				
8	8.1	chemical equilibrium	Synchronous lecturing	Homework	
	8.2				
	8.3				
9	9.1	acids and bases	Synchronous lecturing and Asynchronous lecturing	Quiz	
	9.2				

	9.3				
10	10.1	acids and bases	Synchronous lecturing and Asynchronous lecturing		
	10.2				
	10.3				
11	11.1	Acid base equilibrium and solubility equilibrium	Synchronous lecturing and Asynchronous lecturing	Quiz	
	11.2				
	11.3				
12	12.1	Acid base equilibrium and solubility equilibrium	Synchronous lecturing and Asynchronous lecturing		
	12.2				
	12.3				
13	13.1	Thermodynamics	Synchronous lecturing and Asynchronous lecturing	Quiz	
	13.2				
	13.3				
14	14.1	Thermodynamics	Synchronous lecturing and Asynchronous lecturing		
	14.2				
	14.3				
15	15.1	Redox reaction and the electrochemistry	Synchronous lecturing and Asynchronous lecturing	reports	
	15.2				
	15.3				

- Teaching methods include: Synchronous lecturing/meeting; Asynchronous lecturing/meeting
- Evaluation methods include: Homework, Quiz, Exam, pre-lab quiz...etc

23 Evaluation Methods:

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	Period (Week)	Platform
Homework	5	chemical kinetics	6	Moodle
Homework	5	chemical equilibrium	7	Moodle

Quiz	10	acids and bases	9	Zoom
Quiz	10	Acid base equilibrium and solubility equilibrium	11	Zoom
Quiz	10	Thermodynamics	13	Microsoft forms
Reports	10			Moodle

24 Course Requirements (e.g: students should have a computer, internet connection, webcam, account on a specific software/platform...etc):

students should have a computer and internet connection

25 Course Policies:

- A- Attendance policies:
- B- Absences from exams and submitting assignments on time:
- C- Health and safety procedures:
- D- Honesty policy regarding cheating, plagiarism, misbehavior:
- E- Grading policy:
- F- Available university services that support achievement in the course:

26 References:

- A- Required book(s), assigned reading and audio-visuals:
General Chemistry, by R. Change. Fifth Edition

- B- Recommended books, materials and media:

Chemistry, by Steven S.Zumdahl, 8th edition,

27 Additional information:

Name of Course Coordinator: -----Signature: ----- Date: -----

Head of Curriculum Committee/Department: ----- Signature: -----

Head of Department: ----- Signature: -----

Head of Curriculum Committee/Faculty: ----- Signature: -----

Dean: ----- Signature: -----