



Form: Course Syllabus

Form Number	EXC-01-02-02A
Issue Number and Date	2963/2022/24/3/2 5/12/2022
Number and Date of Revision or Modification	2/(10/12/2023)
Deans Council Approval Decision Number	50/2023
The Date of the Deans Council Approval Decision	26/12/2023
Number of Pages	06

1. Course Title	General Chemistry 1
2. Course Number	0339101
3. Credit Hours (Theory, Practical)	3 Hours
Contact Hours (Theory, Practical)	(3,0)
4. Prerequisites/ Corequisites	-
5. Program Title	BSc in chemistry
6. Program Code	0339
7. School/ Center	School of Science, The University of Jordan
8. Department	Chemistry
9. Course Level	BSc
10. Year of Study and Semester (s)	1st year
11. Other Department(s) Involved in Teaching the Course	NA
12. Main Learning Language	English
13. Learning Types	<input checked="" type="checkbox"/> Face to face learning <input type="checkbox"/> Blended <input type="checkbox"/> Fully online
14. Online Platforms(s)	<input type="checkbox"/> Moodle <input checked="" type="checkbox"/> Microsoft Teams <input checked="" type="checkbox"/> Exambuilder
15. Issuing Date	-
16. Revision Date	18-1-2026

17. Course Coordinator:

Name: Dr. Sharif Arar, Prof.

Contact hours:

Office number: Chemistry Building 1, 2nd floor Phone number:Email: s.arar@ju.edu.jo

**18. Other Instructors:****Year 2023-2024**

Dr. Murad Aldamen, Prof.

Dr. Deeb Taher, Prof.

Dr. Ahmad Makahleh

Dr. Firas Awwadi, Prof.

Dr. Haythem Saadeh

Dr. Almeqdad Habashneh

Dr. Ahmad Barham

Dr. Wissam Helal

Dr. Safwan Fraihat

Dr. Abdussalam Qaroush

Dr. Hazem Amarne

Dr. Nader albujuq

Dr. Ahmad Shawqui

Dr. Khaldon Azzam

Ms. Malak I. Qadri

19. Course Description:

General chemistry 1 is an introductory course intended for first year university students. It covers basic topics including: The scientific method, measurements and significant figures, units and dimensional analysis, naming simple inorganic compounds, stoichiometry, basic reactions in aqueous solutions and solution stoichiometry, properties of gases and kinetic molecular theory, measurements and calculations of energy associated with physical changes and chemical reactions, basic quantum theory and the electronic structure of the atoms, atomic periodic properties, ionic bonding, covalent bonding, molecular geometry, and hybridization of atomic orbitals.

20. Program Intended Learning Outcomes: (To be used in designing the matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program), **the program's student outcomes must fulfill the above ABET student outcomes. You can add new outcomes for your program, but all the six ABET-outcomes must be included.**

SO-1. Problem Solving: Graduates will be able to apply mathematical and scientific knowledge to identify, formulate, and solve technical or scientific problems relevant to the discipline of chemistry.



SO-2. Design: Graduates will be able to use their understanding of chemistry concepts and principles to formulate and design systems, processes, procedures, or programs to meet desired goals and outcomes.

SO-3. Experimental Skills: Graduates will be able to design, conduct, and analyze experiments or test hypotheses, utilizing appropriate chemical techniques and scientific judgment to draw meaningful conclusions.

SO-4. Communication: Graduates will be able to communicate scientific information effectively and accurately to a range of audiences, including both technical and non-technical audiences.

SO-5. Ethics and Global Context: Graduates will understand and apply ethical and professional responsibilities in the context of the impact of technical and scientific solutions on global, economic, environmental, and societal issues.

SO-6. Teamwork: Graduates will be able to work effectively as part of a team, establishing goals, planning tasks, meeting deadlines, and analyzing risk and uncertainty in the context of chemistry-related projects and initiatives.

SO-7. Handling Chemicals: An ability to apply the proper procedures for safe handling of chemicals.

21. Course Intended Learning Outcomes: (Upon completion of the course, the student will be able to achieve the following intended learning outcomes)

1. Utilize the essential concepts of chemistry that will serve as foundation blocks to learning chemical components and processes.
2. Understand fundamental chemical principles related to the composition of matter and the concept of molecular identity.
3. Make quantitative calculations and determinations about the composition of substances and mixtures.
4. Explain the behaviors of gases by the relationships between gas temperature, pressure, amount, and volume.
5. Describe the relationships between chemical changes and thermal energy and determine the quantitative connections between the amounts of substances involved in chemical reactions and symbolize with chemical equations.
6. Derive the predicted ground-state electronic configuration of atoms, and their relationship with some physical properties
7. Explain how individual atoms connect to form more complex structures by valence bond theory.

Course CLOs	The learning levels to be achieved					
	Remembering	Understanding	Applying	Analysing	evaluating	Creating
1	x	x				
2	x	x				
3	x	x				



4	x	x				
5	x	x				
6	x	x				
7	x	x				

22. The matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program:

Program SOs	SO (1)	SO (2)	SO (3)	SO (4)	SO (5)	SO (6)	SO (7)
Course CLOs							
1	x	x					
2	x	x					
3	x	x					
4	x	x					
5	x	x					
6	x	x					
7	x	x					

23. Topic Outline and Schedule:

Week	Lecture	Topic	CLO/s Linked to the Topic	Learning Types (Face to Face/ Blended/ Fully Online)	Platform Used	Synchronous / Asynchronous	Evaluation Methods	Learning Resources
1	1.1	1.1 Modern Chemistry 1.2 Experiment and Explanation	1	Face to Face	In the class	S	MID, Final	textbook
	1.2	1.3 Law of Conversation of Mass 1.4 Matter: Physical State and Chemical Composition 1.5 Measurement and Significant Figures	1	Face to Face	In the class	S	MID, Final	textbook
	1.3	1.6 SI Units 1.7 Derived Units 1.8 Units and Dimensional Analysis	1	Face to Face	In the class	S	MID, Final	textbook
	2.1	2.3 Nuclear Structure and Isotopes 2.4 Atomic Weights	1	Face to Face	In the class	S	MID, Final	textbook
2	2.2	2.8 Naming Simple Compounds	1	Face to Face	In the class	S	MID, Final	textbook



	2.3	2.9 Writing Chemical Equations	1	Face to Face	In the class	S	MID, Final	textbook
3	3.1	2.10 Balancing Chemical Equations	1	Face to Face	In the class	S	MID, Final	textbook
	3.2	3.1 Molecular Weight and Formula Weight 3.2 The Mole Concept	1,2	Face to Face	In the class	S	MID, Final	textbook
	3.3	3.3 Mass Percentages from the Formula 3.4 Elemental Analysis: Percentages of Carbon, Hydrogen, and Oxygen	1,2	Face to Face	In the class	S	MID, Final	textbook
4	4.1	3.5 Determining Formulas 3.6 Molar Interpretation of a Chemical Equation	1,2	Face to Face	In the class	S	MID, Final	textbook
	4.2	3.7 Amounts of Substances in a Chemical Reaction	1,2	Face to Face	In the class	S	MID, Final	textbook
	4.3	3.8 Limiting Reactant, Theoretical and Percentage Yields	1,2	Face to Face	In the class	S	MID, Final	textbook
5	5.1	4.1 Ionic Theory of Solutions and Solubility Rules	1,2	Face to Face	In the class	S	MID, Final	textbook
	5.2	4.2 Molecular and Ionic Equations 4.3 Precipitation Reactions	1,2	Face to Face	In the class	S	MID, Final	textbook
	5.3	4.4 Acid-Base Reactions 4.5 Oxidation Reduction Reactions	1,2	Face to Face	In the class	S	MID, Final	textbook
6	6.1	4.6 Balancing Simple Oxidation-Reduction Equations 4.7 Molar Concentration	1,2	Face to Face	In the class	S	MID, Final	textbook
	6.2	4.8 Diluting Solutions 4.9 Gravimetric Analysis 4.10 Volumetric Analysis	1,2	Face to Face	In the class	S	MID, Final	textbook
	6.3	5.1 Gas Pressure and Its Measurement 5.2 Empirical Gas Law	1,2	Face to Face	In the class	S	Quiz, Final	textbook
7	7.1	5.3 The Ideal Gas Law 5.4 Stoichiometry Problems Involving Gas Volumes	1,2	Face to Face	In the class	S	Quiz, Final	textbook
	7.2	5.5 Gas Mixtures: Law of Partial Pressures	1,2	Face to Face	In the class	S	Quiz, Final	textbook
	7.3	5.6 Kinetic theory of an ideal gas	1,2	Face to Face	In the class	S	Quiz, Final	textbook
8	8.1	5.7 Molecular Speeds: Diffusion and Effusion	1,2	Face to Face	In the class	S	Quiz, Final	textbook
	8.2	6.1 Energy and Its Units 6.2 First Law of Thermodynamics, Work and Heat	1,2	Face to Face	In the class	S	Quiz, Final	textbook
	8.3	6.3 Heat of Reaction, Enthalpy of Reaction 6.4 Thermochemical Equations	1,2	Face to Face	In the class	S	Quiz, Final	textbook
9	9.1	6.5 Applying Stoichiometry to Heats of Reaction	1,2	Face to Face	In the class	S	Quiz, Final	textbook
	9.2	6.6 Measuring Heats of Reaction 6.7 Hess's Law	1,2	Face to Face	In the class	S	Quiz, Final	textbook
	9.3	6.8 Standard Enthalpies of Formation	1,2	Face to Face	In the class	S	Quiz, Final	textbook
10	10.1	7.4 Quantum Mechanics	1,2	Face to Face	In the class	S	Final	textbook
	10.2	7.5 Quantum Numbers and Atomic Orbitals	1,2	Face to Face	In the class	S	Final	textbook
	10.3	8.1 Electron Spin and Pauli Exclusion Principle 8.2 Building-Up Principle and the Periodic Table	1,2	Face to Face	In the class	S	Final	textbook



11	11.1	8.3 Writing Electron Configurations Using the Periodic Table	1,2	Face to Face	In the class	S	Final	textbook
	11.2	8.4 Orbital Diagrams of Atoms, Hund's Rule	1,2	Face to Face	In the class	S	Final	textbook
	11.3	8.6 Some Periodic Properties	1,2	Face to Face	In the class	S	Final	textbook
12	12.1	9.1 Describing Ionic Bonds 9.2 Electron Configurations of Ions	1,2	Face to Face	In the class	S	Final	textbook
	12.2	9.3 Ionic Radii 9.4 Describing Covalent Bonds 9.5 Polar Covalent Bonds and Electronegativity	1,2	Face to Face	In the class	S	Final	textbook
	12.3	9.6 Writing Lewis Electron-Dot Formulas 9.7 Delocalized Bonding: Resonance	1,2	Face to Face	In the class	S	Final	textbook
13	13.1	9.8 Exceptions to the Octet Rule 9.9 Formal Charge and Lewis Formulas	1,2	Face to Face	In the class	S	Final	textbook
	13.2	9.10 Bond Length and Bond Order 9.11 Bond Enthalpy	1,2	Face to Face	In the class	S	Final	textbook
	13.3	10.1 The Valence-Shell Electron-Pair Repulsion (VSEPR) Model	1,2	Face to Face	In the class	S	Final	textbook
14	14.1	10.2 Dipole Moment and Molecular Geometry	1,2	Face to Face	In the class	S	Final	textbook
	14.2	10.3 Valence Bond Theory	1,2	Face to Face	In the class	S	Final	textbook
	14.3	10.4 Description of Multiple Bonding	1,2	Face to Face	In the class	S	Final	textbook

24. Evaluation Methods:

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

Evaluation Activity	Mark	Topic(s)	CLO/s Linked to the Evaluation activity	Period (Week)	Platform
Midterm exam	30	1+2+3+4	1,2,3	6 weeks	On campus computerized exam
Quiz	20	4+5	4,5	3 weeks	On campus computerized exam
Final exam	50	All chapter with more weight devoted to 7-10	1,2,3,4,5,6,7	5 weeks	On campus computerized exam



25. Course Requirements:

(e.g.: students should have a computer, internet connection, webcam, account on a specific software/platform...etc.): A previous knowledge on simple arithmetic/mathematic skills is needed as well as how to use the scientific calculator.

26. Course Policies:

A. Attendance policies:

Students should attend at least 85% of the total number of lectures.

B- Absences from exams and submitting assignments on time:

Students who miss an exam must submit an acceptable excuse and then a makeup exam will be appointed.

C- Health and safety procedures:

Followed according to university regulations.

D- Honesty policy regarding cheating, plagiarism, misbehavior:

Followed according to university regulations.

E- Grading policy:

1. Mid exam 30%
2. Semester work 20%
3. Final exam: 50%

The letter grade scale is adopted.

F- Available university services that support achievement in the course:

27. References:

Required book (s), assigned reading and audio-visuals: General Chemistry, 11th ed., D. Ebbing & S. Gammon, Brooks Cole, 2017.

B- Recommended books, materials, and media:

- 1) Chemistry, 9th ed., S. Zumdahl & S. Zumdahl, Brooks Cole, 2013.
- 2) General Chemistry, The essential concept, 7th ed., R. Chang, McGraw-Hill, 2016.



28. Additional information:

This course is required by almost all students in scientific faculties at the University of Jordan.

Name of the Instructor or the Course Coordinator: Signature: Date:

Dr. Sharif Arrar, Prof.

.....

Date:

Name of the Head of Quality Assurance Signature: Date:

Committee/ Department

Dr. Haytham Saadeh

.....

.....

Name of the Head of Department Signature: Date:

Dr. Firas Awwadi, Prof.

.....

.....

Name of the Head of Quality Assurance Signature: Date:

Committee/ School or Center

Dr. Murad A. AlDamen, Prof.

.....

.....

Name of the Head of Quality Assurance Signature: Date:

Committee/ School or Center

Dr. Mahmoud I. Jaghoub, Prof.

.....

.....