Course Plan for Bachelor program - Study Plan Development and Updating Procedures / Department of Basic Sciences	QF04/0408-4.0E

Study Plan No.	**2021–2022**		**University Specialization**		**Bachelor of Science in Nursing**	
Course No.	**0420819**		**Course Name**		**General Chemistry for Nurses**	
Credit Hours	**3**		**Prerequisite *Co-requisite**		**-**	
Course Type	☐ Mandatory University Requirement	☐ University Elective Requirement	☑ **Faculty Mandatory Requirement**	☐ Support Course Family Requirements	☐ Mandatory Requirement	☐ Elective Requirement
Teaching Style	☐ Full Online Learning		☐ Blended Learning		☑ **Traditional Learning**	
Teaching Model	☐ 1 Synchronous: 1 Asynchronous		☐ 1 Face to Face: 1 Asynchronous		☑ **2 Traditional**	

Faculty Member and Study Divisions Information *(to be filled in each semester by the subject instructor)*

Name	Academic Rank	Office No.	Phone No.	E-mail	
Office Hours (Days/Time)	Sunday, Tuesday, Thursday ()		Monday, Wednesday ()		
Division Number	**Time**	**Place**	**Number of Students**	**Teaching Style**	**Approved Model**
				Traditional Learning	**2 Traditional**

Brief Description

This course covers the fundamental principles and common applications of chemistry for nursing students. Topics include matter, energy, and measurement; atoms, molecules, and ions; chemical reactions and stoichiometry; reactions in aqueous solution; thermochemistry; electronic structure of atoms; periodic properties of the elements; and basic concepts of chemical bonding.

Learning Resources

Course Book Information (Title, author, date of issue, publisher ... etc)	Chemistry: The Central Science. Theodore E. Brown, H. Eugene LeMay, Bruce E. Bursten, Catherine Murphy, Patrick Woodward, Matthew E. Stoltzfus. 2022, 15th ed. Pearson.
Supportive Learning Resources (Books, databases, periodicals, software, applications, others)	1. Chemistry: The Molecular Nature of Matter, James E. Brady, Neil D. Jespersen, Alison Hyslop, 7th Edition International Student Version, 2015. 2. Chemical Principles, The Quest for Insight, Peter Atkins (Oxford University), Loretta Jones (University of Northern Colorado), Leroy Laverman (University of California, Santa Barbara), 7th Edition, 2016. 3. Chemistry, by Raymond Chang Kenneth Goldsby, 12th edition, AP student edition, 2016.

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Supporting Websites	-			
The Physical Environment for Teaching	☑ Classroom	☐ Labs	☑ Virtual Educational Platform	☐ Others
Necessary Equipment and Software	Moodle			
Supporting People with Special Needs	-			
For Technical Support	E-Learning & Open Educational Resources Center. Email: elearning@zuj.edu.jo; Phone: +962 6 429 1511 ext. 425/362.			

Course learning outcomes *(K= Knowledge, S= Skills, C= Competencies)*

No.	Course Learning Outcomes	The Associated Program Learning Output Code
Knowledge **The student should be able to:**		
K1	Recognize the principles of chemistry targeted for nursing students including matter, energy, and measurement; atoms, molecules, and ions; chemical reactions and stoichiometry; reactions in aqueous solution; and thermochemistry.	**MK1**
K2	Identify the fundamental concepts of chemistry that interest nursing students including electronic structure of atoms; periodic properties of the elements; and basic concepts of chemical bonding.	**MK1**
Skills **The student should be able to:**		
S1	Apply SI units, significant figures, scientific notation, and dimensional analysis in calculations while identifying common element symbols and metric prefixes.	**MS2**
S2	Analyze stoichiometric problems by balancing chemical equations, predicting reaction products, performing mass–mole conversions, and determining empirical and molecular formulas.	**MS2**
S3	Apply acid–base and electrolyte concepts to predict reaction products, calculate molarity, perform dilutions, and interpret titration results.	**MS2**
S4	Use thermodynamic principles to calculate internal energy, enthalpy changes, heat transfer, reaction enthalpies using Hess's law, and standard enthalpies of formation.	**MS2**
S5	Apply quantum principles to determine electron configurations, orbital characteristics, atomic structure, and elemental properties, in addition to predict periodic trends and to construct Lewis structures.	**MS2**

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No.	Course Learning Outcomes	The Associated Program Learning Output Code
Competencies **The student should be able to:**		
C1	Not applicable.	

Mechanisms for Direct Evaluation of Learning Outcomes

Type of Assessment / Learning Style	Fully Electronic Learning	Blended Learning	Traditional Learning (Theory Learning)	Traditional Learning (Practical Learning)
Midterm Exam	30%	30%	**30%**	0%
Participation / Practical Applications	0%	0%	**30%**	60%
Asynchronous Interactive Activities	30%	30%	**0%**	0%
Final Exam	40%	40%	**40%**	40%

Note 1: *Asynchronous interactive activities are activities, tasks, projects, assignments, research, studies, projects, and work within student groups ... etc, which the student carries out on his own, through the virtual platform without a direct encounter with the subject teacher.*

Note 2: *According to the Regulations of granting Master's degree at Al-Zaytoonah University of Jordan, 40% of final evaluation goes for the final exam, and 60% for the semester work (examinations, reports, research or any scientific activity assigned to the student).*

Schedule of Simultaneous / Face-to-Face Encounters and their Topics

Week	Subject	Learning Style*	Reference **
1	**1 Introduction: Matter, Energy, and Measurement** 1.1 The Study of Chemistry 1.2 Classifications of Matter 1.3 Properties of Matter	Lecture, participatory learning, group work	pp. 46–59
2	1.5 Units of Measurement 1.6 Uncertainty in Measurement [*Excluded: Significant Figures in Calculations*]	Lecture, participatory learning, group work	pp. 62–73
3	1.7 Dimensional Analysis **2 Atoms, Molecules, and Ions** 2.3 The Modern View of Atomic Structure 2.4 Atomic Weights 2.5 The Periodic Table	Lecture, participatory learning, group work	pp. 76–80, 97–107

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Week	Subject	Learning Style*	Reference **
4	2.6 Molecules and Molecular Compounds 2.7 Ions and Ionic Compounds **3 Chemical Reactions and Stoichiometry** 3.1 The Conservation of Mass, Chemical Equations, and Stoichiometry 3.2 Simple Patterns of Chemical Reactivity: Combination, Decomposition, and Combustion	Lecture, participatory learning, group work	pp. 108–115, 134–142
5	3.3 Formula Weights and Elemental Compositions of Substances 3.4 Avogadro's Number and the Mole; Molar Mass 3.5 Formula Weights and Elemental Compositions of Substances [*Excluded: Combustion Analysis*] 3.6 Reaction Stoichiometry	Lecture, participatory learning, group work	pp. 143–161
6	**4 Reactions in Aqueous Solution** 4.1 General Properties of Aqueous Solutions 4.2 Precipitation Reactions 4.3 Acids, Bases, and Neutralization Reactions 4.4 Oxidation–Reduction Reactions [*Excluded: The Activity Series*]	Lecture, participatory learning, group work	pp. 175–199
7	4.5 Concentrations of Solutions 4.6 Solution Stoichiometry and Chemical Analysis	Lecture, participatory learning, group work	pp. 201–210
8	**5 Thermochemistry** 5.1 The Nature of Chemical Energy 5.2 The First Law of Thermodynamics [*Excluded: State Function*] 5.3 Enthalpy [*Excluded: Pressure–Volume Work*] 5.4 Enthalpies of Reaction 5.5 Calorimetry [*Excluded: Constant-Pressure Calorimetry, Bomb Calorimetry (Constant-Volume Calorimetry)*] 5.6 Hess's Law 5.7 Enthalpies of Formation	Lecture, participatory learning, group work	pp. 219–253
9	**Midterm Exam** **6 Electronic Structure of Atoms** 6.5 Quantum Mechanics and Atomic Orbitals 6.6 Representations of Orbitals 6.7 Many-Electron Atoms	Lecture, participatory learning, group work	pp. 291–302
10	6.8 Electron Configurations 6.9 Electron Configurations and the Periodic Table	Lecture, participatory learning, group work	pp. 303–312

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Week	Subject	Learning Style*	Reference **
11	**7 Periodic Properties of the Elements** 7.2 Effective Nuclear Charge 7.3 Sizes of Atoms and Ions 7.4 Ionization Energy 7.5 Electron Affinity	Lecture, participatory learning, group work	pp. 328–342
12	**8 Basic Concepts of Chemical Bonding** 8.1 Lewis Symbols and the Octet Rule 8.3 Covalent Bonding	Lecture, participatory learning, group work	pp. 369–370, 378–380
13	8.4 Bond Polarity and Electronegativity 8.5 Drawing Lewis Structures	Lecture, participatory learning, group work	pp. 381–392
14	8.6 Resonance Structures 8.7 Exceptions to the Octet Rule 8.8 Strengths and Lengths of Covalent Bonds	Lecture, participatory learning, group work	pp. 393–402
15, 16	**Final Exam**		

** Learning styles: Lecture, flipped learning, learning through projects, learning through problem solving, participatory learning ... etc.*
*** Reference: Pages in a book, database, recorded lecture, content on the e-learning platform, video, website ... etc.*

Schedule of Asynchronous Interactive Activities *(in the case of e-learning and blended learning)*

Week	Task / Activity	Reference	Expected Results
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