



جامعة الزيتونة الأردنية
Al-Zaytoonah University of Jordan
كلية الآداب
Faculty of Arts



فكر حضاري وحوار متمدن
Civilized Thought ... Civilized
Dialogue

"عراقة وجودة"
"Tradition and Quality"

Course Plan for Bachelor program - Study Plan Development and Updating Procedures / Department of Basic Sciences	QF04/0408-4.0E
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Study Plan No.	2022–2023		University Specialization		Bachelor of Physical Therapy	
Course No.	0420814		Course Name		General Chemistry for Medical Sciences	
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)

Faculty, Member and Staff 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
				Blended Learning	1 Face to Face: 1 Asynchronous

Brief Description

This course covers the fundamental principles and common applications of chemistry for physical therapy 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, 15 th 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, computer or laptop, smartphone, zoom			
Supporting People with Special Needs	-			
For Technical Support	E-Learning & Open Educational Resources Center. Email: ellearning@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 pharmacy 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 pharmacy 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.	MS1
S2	Analyze stoichiometric problems by balancing chemical equations, predicting reaction products, performing mass–mole conversions, determining empirical and molecular formulas, and calculating limiting reactants and percent yield.	MS1
S3	Apply acid–base and electrolyte concepts to predict reaction products, calculate molarity, perform dilutions, and interpret titration results.	MS1
S4	Use thermodynamic principles to calculate internal energy, enthalpy changes, and heat transfer.	MS1
S5	Apply quantum principles to determine properties of light, electron configurations, orbital characteristics, atomic structure, and elemental	MS1



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No.	Course Learning Outcomes	The Associated Program Learning Output Code
	properties, in addition to predict periodic trends and to construct Lewis structures.	
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, recorded lecture
2	1.5 Units of Measurement 1.6 Uncertainty in Measurement [<i>Excluded: Significant Figures in Calculations</i>]	Lecture, participatory learning, group work	pp. 62–73, recorded lecture
3	1.7 Dimensional Analysis 2 Atoms, Molecules, and Ions 2.1 The Atomic Theory of Matter 2.3 The Modern View of Atomic Structure	Lecture, participatory learning, group work	pp. 76–80, 89–91, 97–102, recorded lecture



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Week	Subject	Learning Style*	Reference **
	2.4 Atomic Weights		
4	2.5 The Periodic Table 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. 102–115, 134–142, recorded lecture
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 [<i>Excluded: Combustion Analysis</i>] 3.6 Reaction Stoichiometry 3.7 Limiting Reactants	Lecture, participatory learning, group work	pp. 143–166, recorded lecture
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 [<i>Excluded: The Activity Series</i>]	Lecture, participatory learning, group work	pp. 175–199, recorded lecture
7	4.5 Concentrations of Solutions 4.6 Solution Stoichiometry and Chemical Analysis	Lecture, participatory learning, group work	pp. 201–210, recorded lecture
8	5 Thermochemistry 5.1 The Nature of Chemical Energy 5.2 The First Law of Thermodynamics [<i>Excluded: State Function</i>] 5.3 Enthalpy [<i>Excluded: Pressure–Volume Work</i>] 5.4 Enthalpies of Reaction 5.5 Calorimetry [<i>Excluded: Constant-Pressure Calorimetry, Bomb Calorimetry (Constant-Volume Calorimetry)</i>]	Lecture, participatory learning, group work	pp. 219–240, recorded lecture
9	Midterm Exam 6 Electronic Structure of Atoms 6.1 The Wave Nature of Light 6.2 Quantized Energy and Photons 6.5 Quantum Mechanics and Atomic Orbitals	Lecture, participatory learning, group work	pp. 274–280, 291–302, recorded lecture



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Week	Subject	Learning Style*	Reference **
	6.6 Representations of Orbitals 6.7 Many-Electron Atoms		
10	6.8 Electron Configurations 6.9 Electron Configurations and the Periodic Table	Lecture, participatory learning, group work	pp. 303–312, recorded lecture
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, recorded lecture
12	8 Basic Concepts of Chemical Bonding 8.1 Lewis Symbols and the Octet Rule 8.2 Ionic Bonding 8.3 Covalent Bonding	Lecture, participatory learning, group work	pp. 369–380, recorded lecture
13	8.4 Bond Polarity and Electronegativity 8.5 Drawing Lewis Structures	Lecture, participatory learning, group work	pp. 381–392, recorded lecture
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, recorded lecture
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
1	• Watch a recorded lecture	• Video on the E-learning Platform	• Watch the video
2	• Watch a recorded lecture • Do Homework 1	• Video on the E-learning Platform • Assignment 1 on the E-learning Platform	• Watch the video • Answer questions on the portal
3	• Watch a recorded lecture • Do Homework 2	• Video on the E-learning Platform • Assignment 2 on the E-learning Platform	• Watch the video • Answer questions on the portal



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Week	Task / Activity	Reference	Expected Results
4	- Watch a recorded lecture - Do Homework 3	- Video on the E-learning platform - Assignment 3 on the E-learning Platform	- Watch the video - Answer questions on the portal
5	- Watch a recorded lecture - Do Homework 4	- Video on the E-learning Platform - Assignment 4 on the E-learning Platform	- Watch the video - Answer questions on the portal
6	- Watch a recorded lecture - Do Homework 5	- Video on the E-learning Platform - Assignment 5 on the E-learning Platform	- Watch the video - Answer questions on the portal
7	- Watch a recorded lecture - Answer questions embedded in the video (interactive homework 1)	Video on the E-learning Platform	Answer questions embedded in the video / Assignment
8	- Watch a recorded lecture - Do Homework 6	- Video on the E-learning Platform - Assignment 6 on the E-learning Platform	- Watch the video - Answer questions on the portal
9	Midterm Exam		
10	- Watch a recorded lecture - Answer questions embedded in the video (interactive homework 2)	Video on the E-learning Platform	Answer questions embedded in the video / Assignment
11	Watch a recorded lecture	Video on the E-learning Platform	Watch the video
12	Watch a recorded lecture	Video on the E-learning Platform	Watch the video
13	Watch a recorded lecture	Video on the E-learning Platform	Watch the video
14	Self-Study	All Videos on the E-learning Platform	Revision
15,16	Final Exam		