

Standard Institutionally Developed College: N/A

EDGE Compatible: No

Pre-requisites

Co-requisites

Course Description

Provides an introduction to basic chemical principles and concepts which explain the behavior of matter. Topics include measurement and units, atomic structure, chemical bonding, physical states of matter, nomenclature, stoichiometry, acids and bases, gases, liquid mixtures, nuclear chemistry, organic chemistry and biochemistry.

Course Length

	Minutes	Contact Unit
Lecture:	1500	
Lab 2:	1500	
Lab 3:	0	
Practicum/Internship:	0	
Clinical:	0	
Total:	3000	3
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Semester Credit Hours:		3

Competencies

Order	Description	Lecture	Lab2	Lab3	Practicum/Internship	Clinical	Total Minutes	Semester Credit Hrs
1	Measurement and Units	90	110	0	0	0	200	0
2	Atomic Structure	150	165	0	0	0	315	0
3	Chemical Bonding	150	110	0	0	0	260	0
4	Physical States of Matter	90	165	0	0	0	255	0
5	Nomenclature	150	0	0	0	0	150	0
6	Stoichiometry	95	335	0	0	0	430	0
7	Acids and Bases	135	0	0	0	0	135	0
8	Gases	90	0	0	0	0	90	0
9	Liquid Mixtures	140	205	0	0	0	345	0
10	Nuclear Chemistry	120	0	0	0	0	120	0

Order	Description	Lecture	Lab2	Lab3	Practicum/ Internship	Clinical	Total Minutes	Semester Credit Hrs
11	Organic Chemistry	140	205	0	0	0	345	0
12	Biochemistry	150	205	0	0	0	355	0
	Totals for Course ALHS 1127 - Health Sciences Chemistry (version 201003):	1500	1500	0	0	0	3000	3

Learning Outcomes

Measurement and Units

Order	Description	Learning Domain	Level of Learning
1	The student will be able to compute and perform calculations involving density, specific gravity, mass, and volume measurements.	Cognitive	Application
2	The student will be able to use and apply the conventions of exponential notation and significant figures to mathematical operations.	Cognitive	Application
3	The student will be able to use dimensional analysis in calculations involving conversions from one set of units to another.	Cognitive	Application
4	The student will be able to use and perform gravimetric analysis and volumetric analysis.	Cognitive	Application

Atomic Structure

Order	Description	Learning Domain	Level of Learning
1	The student will be able to describe modern atomic theory and the three fundamental particles that make up atoms.	Cognitive	Knowledge
2	The student will be able to summarize the basic ideas of quantum mechanics.	Cognitive	Comprehension
3	The student will be able to relate the electronic configuration of an atom to its position on the periodic table.	Cognitive	Application
4	The student will be able to predict properties and reactivities of elements.	Cognitive	Evaluation

Chemical Bonding

Order	Description	Learning Domain	Level of Learning
1	The student will describe various types of chemical bonding.	Cognitive	Knowledge
2	The student will be able to outline the significance and main ideas of various bonding theories.	Cognitive	Analysis

Physical States of Matter

Order	Description	Learning	Level of Learning
1	The student will be able to describe the general properties of gases, liquids, and solids.	Cognitive	Comprehension
2		Cognitive	Analysis

Order	Description	Learning	Level of Learning
	The student will be able to distinguish among the general properties of gases, liquids, and solids.		
3	The student will be able to discuss the types of changes matter undergoes.	Cognitive	Comprehension

Nomenclature

Order	Description	Learning Domain	Level of Learning
1	The student will be able to name inorganic compounds by the IUPAC system based on their formulas.	Cognitive	Knowledge
2	The student will be able to write formulas of common non organic compounds based on their IUPAC names.	Cognitive	Knowledge

Stoichiometry

Order	Description	Learning Domain	Level of Learning
1	The student will be able to compute and use calculations involving composition stoichiometry and reaction stoichiometry.	Cognitive	Application
2	The student will be able to classify chemical reactions as to type of reaction.	Cognitive	Analysis
3	The student will be able to write examples of each type of chemical reaction.	Cognitive	Knowledge

Acids and Bases

Order	Description	Learning Domain	Level of Learning
1	The student will be able to discuss the properties of acids and bases.	Cognitive	Comprehension
2	The student will be able to describe how to prepare buffers and how buffers maintain pH.	Cognitive	Comprehension
3	The student will be able to compute the pH of a prepared buffer using the Henderson-Hasselbach equation.	Cognitive	Application

Gases

Order	Description	Learning Domain	Level of Learning
1	The student will be able to summarize the general properties of gases.	Cognitive	Comprehension
2	The student will be able to use the gas law equations to describe the behavior of gases.	Cognitive	Application

Liquid Mixtures

Order	Description	Learning Domain	Level of Learning
1	The student will be able to describe properties of a solution.	Cognitive	Knowledge
2	The student will be able to describe methods of expressing concentration.	Cognitive	Knowledge
3	The student will be able to solve problems dealing with concentrations.	Cognitive	Application

Order	Description	Learning Domain	Level of Learning
4	The student will be able to explain concentration gradients, semi permeable membranes, and osmotic pressure.	Cognitive	Comprehension
5	The student will be able to identify properties of a suspension.	Cognitive	Knowledge
6	The student will be able to identify properties of a colloidal dispersion.	Cognitive	Knowledge
7	The student will be able to describe its properties and physical constants.	Cognitive	Comprehension

Nuclear Chemistry

Order	Description	Learning Domain	Level of Learning
1	The student will be able to discuss exposure and dosimetry as relevant to health care workers with potential exposure to x-rays.	Cognitive	Comprehension

Organic Chemistry

Order	Description	Learning Domain	Level of Learning
1	The student will be able to describe and identify alkanes.	Cognitive	Comprehension
2	The student will be able to describe and identify alkenes and alkynes.	Cognitive	Comprehension
3	The student will be able to describe and identify aromatic hydrocarbons.	Cognitive	Knowledge
4	The student will be able to describe and identify hydrocarbon derivatives.	Cognitive	Comprehension
5	The student will be able to describe and identify organic polymers.	Cognitive	Knowledge

Biochemistry

Order	Description	Learning Domain	Level of Learning
1	The student will be able to describe energy requirements of organism.	Cognitive	Comprehension
2	The student will be able to describe and identify proteins.	Cognitive	Comprehension
3	The student will be able to describe and identify enzymes.	Cognitive	Comprehension
4	The student will be able to describe and identify carbohydrates.	Cognitive	Comprehension
5	The student will be able to describe and identify fats and oils.	Cognitive	Knowledge
6	The student will be able to describe and identify nucleic acids.	Cognitive	Comprehension

References

Order	Reference Type	Description
1	Book with Author(s) Listed	Adamson, A.. (1986). A textbook of physical chemistry. (3rd). New York: Elsevier.
2	Book with Author(s) Listed	Bettelheim. (2006). Introduction to general, organic, and biochemistry. (8th). Belmont, CA: Brooks/Cole.
3	Book with Author(s) Listed	

Order	Reference Type	Description
		Bettelheim, B., et. al.. (2006). Introduction to general, organic, and biochemistry: Student solutions manual. (8th). Clifton Park, NY: Centage Delmar.
4	Book with Author(s) Listed	Bretherick, L.. (1986). Hazards in teh chemical laboratory. (4th). London: Royal Society of Chemistry.
5	Book with Author(s) Listed	Cotton, F. A., & Wilkinson, G.. (1999). Advanced inorganic chemistry.. (6th). New York: John Wiley & Sons.
6	Book with Author(s) Listed	Davis, R. E.. (1988). Study Guide to accompany general chemistry with qualitative analysis. (3rd). Philadelphia: Saunders.