CH 004: FUNDAMENTALS OF CHEMISTRY

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Originator
Robert Guinn

Justification / Rationale
Textbook update.
Update SLOs.

Effective Term
Fall 2018

Credit Status
Credit - Degree Applicable

Subject
CH - Chemistry

Course Number
004

Full Course Title
Fundamentals of Chemistry

Short Title
FUND OF CHEMISTRY

Discipline

Disciplines List
Chemistry

Modality
Face-to-Face

Catalog Description
This course is a survey of basic principles of inorganic, organic and bio-organic chemistry presented on a level for the general student. Note: This course, in conjunction with CH 005, meets the requirements for Bachelor's degrees in nursing, dental hygiene and allied health programs.

Schedule Description
This course covers the basic principles of inorganic, organic and biochemistry. Prerequisite: MATH 054 Advisory: ENG 061

Lecture Units
3

Lecture Semester Hours
54

Lab Units
1

Lab Semester Hours
54

In-class Hours
108

Out-of-class Hours
108

Total Course Units
4
Total Semester Hours
216

Prerequisite Course(s)
MATH 054
Advisory: ENG 061

Required Text and Other Instructional Materials

Resource Type
Book

Author
Karen C Timberlake

Title
Chemistry An Introduction to General, Organic, and Biological Chemistry

Edition
13th/e

City
New York, NY

Publisher
Pearson Custom Publishing

Year
2017

College Level
Yes

Flesch-Kincaid Level
12

ISBN #
0-13-442135-3

Resource Type
Book

Author
Karen C Timberlake

Title
Fundamentals of Chemistry College of the Desert/Catalyst

Publisher
Pearson/Benjamin Cummings Publisher

Year
2012

College Level
Yes

Flesch-Kincaid Level
12

Class Size Maximum
24

Entrance Skills
Develop the real number system: integers, rational and irrational numbers.

Prerequisite Course Objectives
MATH 054-Identify, recognize and classify real numbers, as integers, rationals, or irrationals and locate their approximate positions on the real number line.

Entrance Skills
Demonstrate an understanding of the concept of a variable

Prerequisite Course Objectives
MATH 054-Understand the concepts of variables and how variables can be used to represent an unknown quantity or a range of quantities.

Entrance Skills
Use variables to generate algebraic expressions modeling an application (word) problem

Prerequisite Course Objectives
MATH 054-Use variables to create algebraic expressions that model quantities in an application problem.

Entrance Skills
Demonstrate arithmetic of algebraic expressions, including the use of the commutative, associative, distributive, identity, and inverse properties, the use of the order of operations, and the use of integer exponents and the rules of exponents.

Prerequisite Course Objectives
MATH 054-Use the properties of integer exponents to simplify algebraic expressions, including expressions involving scientific notation.

Entrance Skills
Create equations that model real world situations given in application (word) problems.

Prerequisite Course Objectives
MATH 054-Use variables to create algebraic expressions that model quantities in an application problem.

Entrance Skills
Demonstrate critical thinking skills when reading, composing, and participating in class discussions.

Prerequisite Course Objectives
ENG 061-Demonstrate the ability to think critically and express ideas using various patterns of development.

Entrance Skills
Demonstrate the ability to read and respond in writing beyond the literal interpretation of the text.

Prerequisite Course Objectives
ENG 061-Demonstrate the ability to read and respond in writing beyond the literal interpretation of the text.

Entrance Skills
Develop, organize, and express complex ideas in both expository and research papers.

Prerequisite Course Objectives

ENG 061-Use theses to organize paragraphs into coherent analyses.

Course Content

1. Scientific measurement.
2. Matter and energy.
3. The structure of atoms and elements
4. The Periodic Table.
5. Compounds and chemical bonds.
6. Chemical reactions and chemical quantities
7. States of matter: solid, liquid and gas
8. Acids, bases, salts & buffers.
9. Solutions
10. Chemical Equilibrium
11. Carbon chains & rings, saturated and unsaturated hydrocarbons
12. Halocarbons, alcohols and ethers.
13. Aldehydes, ketones and sulfur compounds
14. Carboxylic acids & their derivatives.
15. Carbohydrates.
16. Lipids
17. Amino acids, peptides, proteins and enzymes
18. Nucleic acids
19. Metabolic pathways and energy production

Lab Content

a. Safety rules, Measurement and Significant Figures b. Conversion Factors in Calculations c. Density and Specific Gravity d. Energy and States of Matter e. Atomic Structure f. Electron Configuration and Periodic Properties g. Compounds and their formulas h. Chemical reactions and equations i. Reaction rates and equilibrium j. Solutions, Colloids and Suspensions k. Acid-Base Titrations l. Properties of Organic Compounds m. Structure of Alkanes n. Alcohols and Phenols o. Aldehydes and Ketones p. Amines and Amides q. Types of Carbohydrates r. Tests for carbohydrates s. Amino acids t. Peptides and Proteins u. Enzymes

Course Objectives

	Objectives
Objective 1	Describe the major principles of chemistry.
Objective 2	Describe the major categories of inorganic and organic chemical and biochemical reactions.
Objective 3	Balance reactions and perform calculations based on balanced reactions.
Objective 4	Explain Metric measurement and its importance in the physical science domain.
Objective 5	Describe inorganic and organic nomenclature as applies to compound compositions.
Objective 6	Describe the major functional groups of organic compounds.
Objective 7	Explain oxidation-reduction in the process of metabolism.
Objective 8	Describe the major groups of biological molecules and their essential functions in metabolism and heredity.
Objective 9	Collect and interpret data in the lab.
Objective 10	Work in teams and respect the opinions of others.

Student Learning Outcomes

	Upon satisfactory completion of this course, students will be able to:
Outcome 1	Analyze quantitative data to draw plausible conclusions.
Outcome 2	Relate the macroscale phenomena of human physiological functions to microscale atomic concepts.
Outcome 3	Apply chemical terminology to describe observed scientific phenomena.
Outcome 4	Perform basic allied health laboratory experiments safely and accurately.

Methods of Instruction

Method	Please provide a description or examples of how each instructional method will be used in this course.
Journal	
Participation	
Observation	
Lecture	
Experiential	
Discussion	
Laboratory	Laboratory consists of manipulation of equipment and conducting exercises for the purpose of making direct findings regarding chemical behavior. Procedures and their findings are followed by drawing conclusions based on interpretation of events and calculations are carried out as appropriate. Students work individually in laboratory for the purpose of receiving the full benefit of the learning experience.

Methods of Evaluation

Method	Please provide a description or examples of how each evaluation method will be used in this course.	Type of Assignment
Written homework		
Mid-term and final evaluations	A comprehensive final examination will be administered covering all previously completed topics for the semester. Questions will require problem solving, short answer and matching.	
Tests/Quizzes/Examinations	An examination will be given covering each topic area described in course content. The examinations will consist of statement answers and problem solving. A total of approximately 10 quizzes, 4 exams, 21 lab reports and a comprehensive final exam.	
Group activity participation/observation		
Laboratory projects		

Assignments

Other In-class Assignments

1. Quizzes and exams
2. Lab experiments
3. Laboratory reports

Other Out-of-class Assignments

1. Reading assignments
2. Homework assignments
3. Pre-laboratory assignments

Grade Methods

Letter Grade Only

COD GE

C1 - Natural Sciences

CSU GE

B1 - Physical Science
B3 - Laboratory Activity

MIS Course Data

CIP Code
40.0501 - Chemistry, General.

TOP Code
190500 - Chemistry, General

SAM Code
E - Non-Occupational

Basic Skills Status
Not Basic Skills

Prior College Level
Not applicable

Cooperative Work Experience
Not a Coop Course

Course Classification Status
Credit Course

Approved Special Class
Not special class

Noncredit Category
Not Applicable, Credit Course

Funding Agency Category
Not Applicable

Program Status
Program Applicable

Transfer Status
Transferable to CSU only

Allow Audit
No

Repeatability
No

Materials Fee
No

Additional Fees?
No

Approvals

Curriculum Committee Approval Date
11/7/2017

Academic Senate Approval Date
11/30/2017

Board of Trustees Approval Date
12/15/2017

Course Control Number

CCC000177061

Programs referencing this course

Liberal Arts: Math and Science AA Degree (http://catalog.collegeofthedesert.eduundefined?key=29/)
Public Health Science AS-T Degree (http://catalog.collegeofthedesert.eduundefined?key=37/)