

CH 004: FUNDAMENTALS OF CHEMISTRY

Changes saved but not submitted

Originator

dmayo

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

Hybrid

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 Education

Year

2018

College Level

Yes

Flesch-Kincaid Level

12

ISBN #

0-13-442135-3

Resource Type

Manual

Author

Karen C Timberlake

Title

Laboratory Manual for General, Organic, and Biological Chemistry

Publisher

Pearson Education

Year

2014

Class Size Maximum

24

Entrance Skills

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

Requisite 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

Requisite 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

Requisite 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.

Requisite 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.

Requisite 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.

Requisite 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.

Requisite 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.

Requisite Course Objectives

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

Course Content

1. Chemistry and the scientific method
2. Measurements
3. Matter and energy
4. Atoms and elements
5. Ionic and molecular compounds
6. Chemical reactions and stoichiometry

7. Gases
8. Solutions
9. Acids, bases, and equilibrium
10. Hydrocarbons
11. Alcohols, thiols, ethers, aldehydes, and ketones
12. Carbohydrates
13. Carboxylic acids, esters, amines, and amides
14. Lipids
15. Amino acids, proteins, and enzymes

Lab Content

1. Safety in the laboratory
2. Measurement
3. Conversion factors
4. Density and specific gravity
5. Temperature and specific heat
6. Energy and matter
7. The periodic table
8. Atoms and elements
9. Ionic and molecular compounds
10. Chemical reactions and equations
11. Gases
12. Properties of solutions
13. Reaction rates and chemical equilibrium
14. Acids, bases, pH, and buffers
15. Alkanes
16. Unsaturated hydrocarbons
17. Alcohols and phenols
18. Aldehydes and ketones
19. Carboxylic acids and esters
20. Carbohydrates
21. Saponification
22. Amino acids and chromatography

Course Objectives

| | Objectives |
|--------------|--|
| Objective 1 | Describe the major principles of chemistry. |
| Objective 2 | Identify and distinguish the major categories of inorganic and organic chemical and biochemical reactions. |
| Objective 3 | Balance reactions and perform stoichiometry calculations. |
| Objective 4 | Explain metric measurement and its importance in the physical science domain. |
| Objective 5 | Describe inorganic and organic nomenclature. |
| Objective 6 | Illustrate and name the major functional groups of organic compounds. |
| Objective 7 | Explain oxidation and reduction as it applies to both chemical and biological systems. |
| Objective 8 | Describe the major groups of biological molecules and their essential functions in metabolism. |
| Objective 9 | Collect and interpret data in the laboratory setting. |
| Objective 10 | Collaborate respectfully with fellow students in the laboratory. |

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 | Demonstrate to students how to read and analyze a scientific journal chosen by the faculty which relate to a current lecture/news topic. |
| Participation | Students will perform chemical experiments. |
| Observation | Guide and monitor group work in class and lab. |
| Lecture | Chemical concepts will be explained in a traditional lecture setting. |
| Discussion | Students will take part in problem-solving activities wherein they will collect data and use it to draw conclusions. |
| 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 | Weekly homework on lecture material. | In and Out of Class |
| 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. | In Class Only |
| 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. | In Class Only |
| Group activity participation/observation | Online discussion boards, videos, and interactive simulations. | In and Out of Class |
| Laboratory projects | Analyzing experimental data, performing weekly labs, completing pre-lab assignments. | In and Out of Class |
| Reading reports | Students will read articles from the scientific literature and write a summary. | Out of Class Only |

Assignments

Other In-class Assignments

1. Laboratory experiments
2. Laboratory reports

Other Out-of-class Assignments

1. Reading assignments

Grade Methods

Letter Grade Only

Distance Education Checklist

Include the percentage of online and on-campus instruction you anticipate.

Online %

40

On-campus %

60

Lab Courses**How will the lab component of your course be differentiated from the lecture component of the course?**

Laboratory experiments will remain the same, face-to-face.

From the COR list, what activities are specified as lab, and how will those be monitored by the instructor?

Laboratory experiments will remain the same, face-to-face.

How will you assess the online delivery of lab activities?

Laboratory experiments will remain the same, face-to-face.

Instructional Materials and Resources**Effective Student/Faculty Contact****Which of the following methods of regular, timely, and effective student/faculty contact will be used in this course?****Within Course Management System:**

Chat room/instant messaging
Discussion forums with substantive instructor participation
Regular virtual office hours
Timely feedback and return of student work as specified in the syllabus
Weekly announcements

External to Course Management System:

Direct e-mail
Posted audio/video (including YouTube, 3cm mediasolutions, etc.)
Teleconferencing

For hybrid courses:

Library workshops
Orientation, study, and/or review sessions
Scheduled Face-to-Face group or individual meetings
Supplemental seminar or study sessions

Briefly discuss how the selected strategies above will be used to maintain Regular Effective Contact in the course.

Chat rooms and substantive discussion forums will improve student to student interactions. Virtual office, direct e-mail, teleconferencing, and posted audio/video's will improve student to faculty accessibility for students. Library workshops can be used to introduce scientific literature. Online review or study sessions and face-to-face group discussions will improve both student to student and student to faculty interactions.

Other Information**Provide any other relevant information that will help the Curriculum Committee assess the viability of offering this course in an online or hybrid modality.**

All posted content will continue to be accessible to all students.

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

11/18/2021

Academic Senate Approval Date

12/09/2021

Board of Trustees Approval Date

01/21/2022

Chancellor's Office Approval Date

03/11/2010

Course Control Number

CCC000177061

Programs referencing this courseLiberal Arts: Math and Science AA Degree (<http://catalog.collegeofthedesert.eduundefined/?key=29>)Public Health Science AS-T Degree (<http://catalog.collegeofthedesert.eduundefined/?key=37>)Nutrition and Dietetics AS-T Degree (<http://catalog.collegeofthedesert.eduundefined/?key=7>)