

CH 003: INTRODUCTORY GENERAL CHEMISTRY

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Originator

cmelton

Justification / Rationale

Update SLOs

Effective Term

Spring 2020

Credit Status

Credit - Degree Applicable

Subject

CH - Chemistry

Course Number

003

Full Course Title

Introductory General Chemistry

Short Title

INTRO GENERAL CHEM

Discipline**Disciplines List**

Chemistry

Modality

Face-to-Face

Catalog Description

This course is the study of the principles of inorganic chemistry. Instruction is given in calculations, atomic theory, periodic law, compounds, bonding, nomenclature, states of matter, reaction types, composition, stoichiometry, acids, bases, pH, gas laws, and solutions. Laboratory is a hands-on experience stressing manipulation, procedure, data, and outcome calculations. Note: This course should be taken by Liberal Studies majors on the Education track to satisfy the chemistry requirement. It should also be taken as a prerequisite for CH 001A for students who have not had high school chemistry within the past 5 years.

Schedule Description

This course gives an overview of inorganic chemistry and teaches the students the proper chemical laboratory techniques. Prerequisite: MATH 054 Advisory: ENG 061 IGETC: 5A*, 5C*

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

Zumdahl-Decoste

Title

Introductory Chemistry A Foundation

Edition

9th

Publisher

Cengage Learning

Year

2014

College Level

Yes

Flesch-Kincaid Level

12

Resource Type

Manual

Author

Hall, J., Little, J.

Title

Introductory Chemistry in the Laboratory

Publisher

Cengage Learning

Year

2015-01-01

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

Understand 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

Advisory skill: Demonstrate a 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

Advisory skill: 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

Advisory skill: 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.

ENG 061-Demonstrate the ability to use research skills including library resources such as books, periodicals, electronic databases and online resources such as the internet.

Course Content

1. Chemistry: An Introduction
2. Measurements and Calculations
3. Matter
4. Chemical Foundations: Elements, Atoms and Ions

5. Nomenclature
6. Chemical Reactions: An Introduction
7. Reactions in Aqueous Solutions
8. Chemical Composition
9. Chemical Quantities
10. Energy
11. Modern Atomic Theory
12. Chemical Bonding
13. Gases
14. Liquids and Solids
15. Solutions
16. Acids and Bases
17. Equilibrium
18. Oxidation-Reduction Reactions and Electrochemistry

Lab Content

1. Safety Rules & Laboratory measurements: Balances
2. Use of Volumetric Glassware
3. Density determination of a solid, liquid and of a solution
4. Calorimetry: Calculation of the specific heat of a metal.
5. Metathesis (double displacement) reactions (precipitation)
6. Oxidation-reduction reactions
7. Graphing the data & making polymers (handout)
8. Determine the % composition of MgO by reacting Mg with O₂. Calculate the empirical formula.
9. Stoichiometry and Limiting reactant
10. Line Spectra
11. Lewis Structures and Molecular Shapes
12. Molar mass of a volatile liquid
13. Properties and Reactions of acids and bases; measurement of pH
14. Acid-Base Titrations
15. Scientific Abstract

Course Objectives

Objectives	
Objective 1	Demonstrate an understanding of the fundamental concepts of chemistry with their applications to human affairs.
Objective 2	Discuss major historical chemistry discoveries which have been a part of human social and technological development.
Objective 3	Demonstrate use of tools and instruments involved in making findings in chemical behavior.
Objective 4	Solve chemistry problems with the coupled recognition that calculation methods in chemistry are shared in other domains such as business, economics, and technology.
Objective 5	Demonstrate the ability to raise questions and how to formulate them clearly
Objective 6	Demonstrate the ability to collect and interpret the data
Objective 7	Demonstrate the ability to work in teams and to respect other people's opinions

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 daily life to microscale atomic concepts.
Outcome 3	Apply scientific literacy to vet sources and summarize observed chemical phenomena.
Outcome 4	Perform basic general chemistry 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	Supplemental readings focusing on historical events in chemistry and the every-day applications of chemistry develops an awareness and understanding of chemistry beyond the concise principles offered in the assigned text
Experiential	
Discussion	
Participation	
Observation	
Lecture	
Laboratory	

Methods of Evaluation

Method	Please provide a description or examples of how each evaluation method will be used in this course.	Type of Assignment
Guided/unguided journals	A typed scientific abstract based on an assigned reading of a chemical article.	
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 #8 above. The examinations will consist of statement answers and problem solving. There will be four exams, 15 quizzes.	
Group activity participation/observation		
Laboratory projects		

Assignments
Other In-class Assignments

Quizzes and exams
Lab experiments

Other Out-of-class Assignments

- Complete and receive certification of completion for all pre-laboratory assignment sheets. Approximately 15 assignments.
- Complete and receive certification of completion for all pre-laboratory procedure write-ups. Approximately 15 assignments.
- Submit laboratory work for evaluation and completeness and correctness of data and calculations. Approximately 15 lab experiments (listed under course content)

Grade Methods

Letter Grade Only

COD GE

C1 - Natural Sciences

CSU GE

B1 - Physical Science
B3 - Laboratory Activity

IGETC GE

5A - Physical Science
5C - Science Laboratory

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

Transfer CSU, limited UC

C-ID

CHEM 101

Allow Audit

No

Repeatability

No

Materials Fee

No

Additional Fees?

No

Approvals

Curriculum Committee Approval Date

3/5/2019

Academic Senate Approval Date

3/14/2019

Board of Trustees Approval Date

5/17/2019

Course Control Number

CCC000333773

Programs referencing this courseLiberal Arts: Math and Science AA Degree (<http://catalog.collegeofthedesert.eduundefined?key=29/>)Agri-Business AS Degree (<http://catalog.collegeofthedesert.eduundefined?key=46/>)General Agriculture AS Degree (<http://catalog.collegeofthedesert.eduundefined?key=49/>)Elementary Teacher Education AA-T Degree (<http://catalog.collegeofthedesert.eduundefined?key=5/>)Agriculture Food Safety Certificate of Achievement (<http://catalog.collegeofthedesert.eduundefined?key=83/>)Agriculture Office Assistant Certificate of Achievement (<http://catalog.collegeofthedesert.eduundefined?key=84/>)Agriculture Office Professional Certificate of Achievement (<http://catalog.collegeofthedesert.eduundefined?key=85/>)Agriculture Pest Management Certificate of Achievement (<http://catalog.collegeofthedesert.eduundefined?key=86/>)Agriculture Technician Certificate of Achievement (<http://catalog.collegeofthedesert.eduundefined?key=87/>)Agriculture Plant Science AS-T Degree (<http://catalog.collegeofthedesert.eduundefined?key=89/>)Agriculture Irrigation Technician Certificate of Achievement (<http://catalog.collegeofthedesert.eduundefined?key=91/>)