GROSSMONT COLLEGE

COURSE OUTLINE OF RECORD

Curriculum Committee Approval: 11/30/2021

GCCCD Governing Board Approval: 12/14/2021

CHEMISTRY 115 - FUNDAMENTALS OF CHEMISTRY

1. Course Number Course Title Semester Units

CHEM 115 Fundamentals of Chemistry 4

Semester Hours

3 hours lecture: 48-54 hours 96-108 outside of class hours 3 hours lab: 48-54 hours

192-216 total hours

2. Course Prerequisites

A “Pass” grade or higher in Math 090 or equivalent or appropriate mathematics placement.

Corequisite

None

Recommended Preparation

None

3. Catalog Description

Elementary principles of inorganic and general chemistry with an overview of organic and biochemistry. Basic chemical terminology, problem solving techniques and chemical explanations of our environment will be studied. Chemical concepts will be explained through common applications such as health science and forensic science. Previous chemistry background is helpful, but not required. This course is recommended for students needing a one semester general chemistry laboratory course. This course does not satisfy the prerequisite for Chemistry 141. Students will not receive credit toward graduation for more than one of the following courses: Chemistry 113, Chemistry 115 and Chemistry 120.

4. Course Objectives

The student will:

a. Identify, categorize, and name a variety of chemical compounds based upon their chemical formula.

b. Write, balance, and interpret chemical and nuclear equations.

c. Analyze problems to identify data, unknown value, and determine an appropriate method of solution.

d. Utilize unit dimensional analysis to solve a variety of chemical conversion problems.

e. Describe atomic structure, periodicity and molecular structure in terms of subatomic particles.

f. Explain chemical phenomena in molecular terms.

g. Perform and analyze chemical experiments in the laboratory.

5. Instructional Facilities

a. Standard classroom and laboratory.

b. Wall mounted Periodic Chart.

c. Facilities for lecture demonstrations, including a lecture table with as, air, water, vacuum, and sink.

d. Individual student drawers containing standard laboratory equipment including but not limited to beakers, Erlenmeyer flasks, graduated cylinders, glass funnels, pipets, test tubes, test tube racks, and assorted scoopulas, stir rods, and spatulas.

e. Laboratory classroom including but not limited to fume hoods, hot plates, magnetic stir plates, triple beam balances, analytical balances, Bunsen burners and microburners.

6. Special Materials Required of Student

a. Scientific calculator with exponential and logarithmic functionality.

b. Approved safety glasses.

c. Laboratory apron or jacket.

7. Course Content

a. Units and conversions, metric system, density.

b. Elements, compounds and formulas.

c. Atomic structure and the periodic table.

d. Chemical bonding.

e. IUPAC nomenclature.

f. Chemical reactions, stoichiometry.

g. States of matter, gas, liquid, and solid properties.

h. Solution chemistry, acids and bases.

i. Oxidation and reduction reactions.

j. Nuclear chemistry.

k. Organic chemistry.

l. Biochemistry.

8. Method of Instruction

a. Lecture with an emphasis on quantitative and qualitative problem solving.

b. Discussion of topics related to course material both in-person and in the learning management system.

C. Demonstrations of chemical phenomenon, videos, PowerPoints, other multimedia, etc.

d. Inquiry-based laboratory experiences.

e. Peer presentations.

9. Methods of Evaluating Student Performance

a. Written exams and final exam which may include fill-in-the-blank, short answer, multiple choice, and essay questions

b. Laboratory reports such as descriptions and analysis of chemical reactions or analytical determinations.

c. Laboratory techniques to include proper safety procedures, use of laboratory equ9pment, and complete documentation of data.

d. Essays/presentations on topics such as experimental results, descriptive chemistry or current issues in chemistry.

e. Homework and various assignments are used to teach and emphasize content including, but not limited to reading texts, watching videos, or computer aided instructional exercises.

10. Outside Class Assignments

1. Laboratory reports such as descriptions and analysis of chemical reactions or analytical determinations.
2. Essays/presentations on topics such as experimental results descriptive chemistry or current issues in chemistry
3. Homework, both text and computer based. Homework and various assignments are used to teach and emphasize content including, but not limited to reading texts, watching videos, or computer aided instructional exercises.

11. Representative Texts

a. Representative Text(s):

(1) Hein, Morris and Susan Arena. *Foundations of College* Chemistry. 15th edition. Hoboken, NJ: John Wiley & Sons, 2016.

(2) Laboratory Manual. Willard, Cary *Chem 115 Laboratory Manual*, 3rd edition, El Cajon, California: Grossmont College, 2019.

b. Supplementary texts and workbooks:

None.

Addendum: Student Learning Outcomes

Upon completion of this course, our students will be able to do the following:

* 1. Demonstrate a working knowledge of the language of chemistry.
  2. Apply quantitative reasoning to chemical problems
  3. Apply a laws and theories to explain and predict the properties of atoms and molecules
  4. Employ laboratory equipment and techniques to collect, organize and evaluate experimental data.