

# NC 221A: CHEMISTRY A

## Citrus College Course Outline of Record

Heading	Value
Effective Term:	Fall 2021
Credits:	0
Total Contact Hours:	60
Lecture Hours :	60
Lab Hours:	0
Hours Arranged:	0
Outside of Class Hours:	120
Prerequisite:	Placement by a high school counselor.
Transferable to CSU:	No
Transferable to UC:	No
Grading Method:	Non-Credit Course

## Catalog Course Description

Principles of chemistry are developed through laboratory observations of physical properties and chemical reactions. The language, formulas, and equations of chemistry are used in interpreting atomic structure, chemical bonding, periodic behavior of elements, rates and energies of chemical and nuclear change, equilibrium of gaseous systems, acids and bases, oxidation-reduction, and organic functional groups. This course format will include activity-based investigations with hands-on activities, concepts, and applications compliant with the adopted California State Science Standards to meet the minimum course requirements for high school graduation. 60 lecture hours.

## Course Objectives

- Use the periodic table to identify metals, semimetals, nonmetals, and halogens.
- Describe the observable properties of acids, bases, and salt solutions.
- Calculate the concentration of a solute in terms of grams per liter, molarity, parts per million, and percent composition.
- Describe temperature and heat flow in terms of the motion of molecules (or atoms).
- Solve problems involving heat flow and temperature changes, using known values of specific heat and latent heat of phase change.
- Understand how reaction rates depend on such factors as concentration, temperature, and pressure.
- Write and calculate an equilibrium constant expression for a reaction.
- Identify the functional groups that form the basis of alcohols, ketones, ethers, amines, esters, aldehydes, and organic acids.
- Name the three most common forms of radioactive decay (alpha, beta, and gamma) and know how the nucleus changes in each type of decay.
- Understand the relationship between the position of an element in the periodic table and its atomic number and atomic mass.
- Draw Lewis dot structures.
- Identify solids and liquids held together by Van der Waals forces and hydrogen bonding and relate these forces to volatility and boiling/melting point temperatures.
- Determine the molar mass of a molecule from its chemical formula and a table of atomic masses and how to convert the mass of a

molecular substance to moles, number of particles, or volume of gas at standard temperature and pressure.

- Calculate the masses of reactants and products in a chemical reaction from the mass of one of the reactants or products and the relevant atomic masses.
- Apply the gas laws to relations between the pressure, temperature, and volume of any amount of an ideal gas or any mixture of ideal gases.
- Convert between the Celsius and Kelvin temperature scales.
- Use the pH scale to characterize acid and base solutions.

## Major Course Content

1. Atomic and molecular structure
2. Chemical bonds
3. Conservation of matter and stoichiometry
4. Gases and their properties
5. Acids and bases
6. Solutions
7. Chemical thermodynamics
8. Reaction rates
9. Chemical equilibrium
10. Organic chemistry and biochemistry
11. Nuclear processes

## Suggested Reading Other Than Required Textbook

Instructor supplied material

## Examples of Required Writing Assignments

Lab reports

## Examples of Outside Assignments

Daily homework and answers to review questions

## Instruction Type(s)

Lecture, Online Education Lecture