

**COURSE PREFIX & NUMBER:
CHM 110**

INSTRUCTOR:

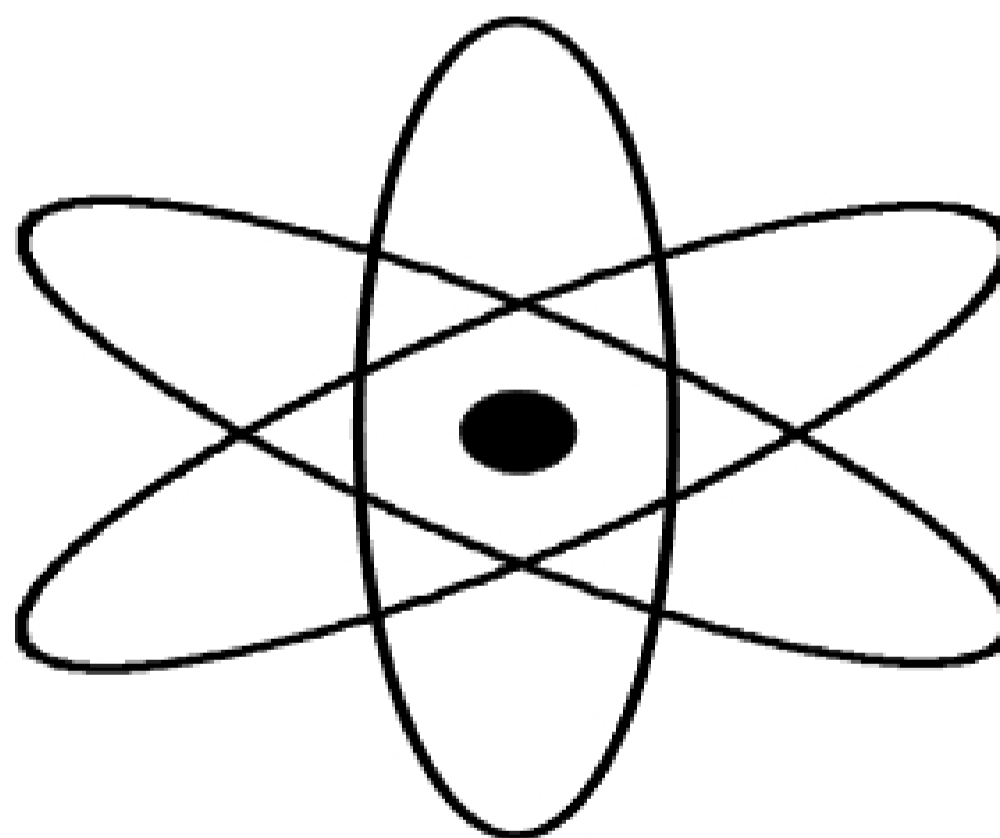
OFFICE:

OFFICE TELEPHONE:

SECRETARY:

OFFICE HOURS:

CLASS SCHEDULE:



DEPARTMENT OF NATURAL SCIENCES

COURSE SYLLABUS

COURSE TITLE:	College Chemistry I	PREFIX & NUMBER:	CHM 110
LECTURE HOURS:	3.0	LAB HOURS:	3.0
CONTACT HOURS:	6.0	CREDIT HOURS:	4.0
TUTORIAL HOURS:	1.0		

CATALOG DESCRIPTION:

This is the first course in a two-course study of: atomic and molecular structures; nomenclature and equations; properties, reactions and states of matter; stoichiometry; gas laws; and acid/base systems.

Prerequisites: MAT110 (College Algebra) or MAT112 (Pre-calculus)

COURSE DESCRIPTION:

This course places emphasis on the practical nature of chemistry as well as problem-solving. The student will be instructed in (i) the foundations of chemistry; (ii) the structure of atoms and molecules; (iii) the fundamentals of nuclear chemistry; (iv) chemical periodicity, nomenclature and bonding; (v) chemical formulas, equations, and stoichiometry; (vi) properties of the gaseous state, with ideal gas laws, and the properties of liquids, solids, and solutions; (vii) definitions and properties of acids and bases, the pH scale, and acid/base titrations.

Laboratory sessions will enhance the lecture series and give the student a "hands-on" feeling for the topics listed above. Tutorial sessions utilizing audiovisual materials and computer educational software will supplement the lecture series and emphasize problem-solving.

TEXTBOOKS AND OTHER REQUIRED MATERIALS:

TEXT: *Chang, R.; Overby J.; Chemistry*, 13th ed., McGraw Hill, 2019.

LAB MANUAL: Laboratory Manual for CHM 110 (General Chemistry I); provided via D2L.

CALCULATOR: Scientific (TI-35 or above or equivalent); it should have an INV LOG function key.

LAB NOTEBOOK: A bound, **non-spiral**, notebook, such as an English composition book.

SAFETY GLASSES: Shatter-proof, with side shields (required by State law); students with ordinary glasses must wear goggles or obtain shatter-proof lenses.

RECOMMENDED MATERIALS (optional):

SOLUTIONS MANUAL: Wilson; Solutions to Exercises, 14th ed., Pearson, 2017.

LAB APRON: Protective plastic or rubber (alternative: lab jacket).

COURSE OBJECTIVES:

Upon completion of the course, the student should be able to:

1. Report numerical results in scientific notation, utilizing proper units and the appropriate number of significant figures.
2. Relate atomic and molecular properties of matter to chemical periodicity and bonding.
3. Identify the products of nuclear decay.
4. Name simple inorganic compounds making use of the periodic table.
5. Complete and balance chemical equations.
6. Classify chemical reactions according to types.
7. Define stoichiometry and identify the limiting reagent in a chemical reaction.
8. Calculate the stoichiometric amount(s) (mass, moles, volume or pressure) of product(s) from the amount of reactant(s) for a given chemical reaction.
9. Determine molar concentration and weight percent of a solute in solution.
10. Utilize Lewis structures and molecular models to describe the structure and shape of molecules, and thereby explain the properties of gases, liquids, and solids.
11. Utilize ideal gas laws to calculate temperature, pressure, volume, amount, density or molecular weight of a gas.
12. Explain the relevance of vapor pressure in phase changes, and its effect on the properties of solutions.
13. Define colligative properties. Be able to calculate the colligative properties (freezing point depression, boiling point elevation, osmotic pressure) of solutions.
14. Define intermolecular forces and be able to describe their effect on physical properties of solids, liquids and gases.
15. List general properties of acids and bases. Explain Arrhenius, Bronsted-Lowry and Lewis definitions of acids and bases.
16. Calculate the pH and pOH values of dilute solutions of acids and bases, and identify the basic concepts of acid-base titrations.
17. Complete and balance the equations for Acid/Base and Precipitation reactions.