

Montgomery County Community College
CHE 131
Chemistry for Technology I
4-3-3

COURSE DESCRIPTION:

A general course in physical-inorganic and organic chemistry. Emphasis will be placed on the theoretical and descriptive attributes of chemistry, so as to form a sound basis for the understanding of the analytical and biological chemistry and their application to technology. Laboratory experiments will be performed so as to facilitate an understanding of the chemical principles and experimental techniques developed in the program. This course is subject to a course fee. Refer to <http://mc3.edu/adm-fin-aid/paying/tuition/course-fees> for current rates.

REQUISITES:

Previous course Requirements

High School Chemistry or equivalent (e.g., CHE 121 General Chemistry I)

Concurrent Course Requirements

None

LEARNING OUTCOMES	LEARNING ACTIVITIES	EVALUATION METHODS
Upon successful completion of this course, the student will be able to: 1. Explain basic principles of inorganic-physical chemistry.	Lectures Class Discussions Laboratory Experiments Daily Readings	

LEARNING OUTCOMES LEARNING ~~ACT~~ 66

- b) Covalent compounds
 - 1) Lewis structures-simple elements and inorganic compounds
 - 2) Lewis structures-simple organic
 - 3) Lewis structures-Resonance and Coordinate covalent bonding
 - 4) Lewis structure-Polyatomic ions
 - 5) Lewis structures-exceptions to the octet rule
 - 6) Electronegativity and polar bonds
 - 7) VSEPR and molecular shape
 - 8) Molecular polarity
- 12. States of matter
 - a) General properties of solid, liquids, and gases
 - b) Kinetic-molecular theory
 - c) Gas laws
 - 1) Boyle
 - 2) Charles
 - 3) Combined
 - 4) Dalton
 - 5) Gay-Lussac
 - 6) Avogadro
 - 7) Ideal gas behavior
 - d) Intermolecular Forces and states of matter
 - 1) Dispersion force
 - 2) Dipole-dipole force
 - 3) Hydrogen Bond
 - e) General properties of liquids (water)
- 13. Introduction to solution chemistry
 - a) General properties of solutions and suspensions

15. Equilibrium and kinetics
 - a) Kinetic factors and collision theory
 - b) Reversible reactions and equilibrium
 - c) Le Chatelier's Principle
 - d) Equilibrium constants
 - e) Ionization and solubility products constants
 - f) Buffers
16. Reduction and oxidation
 - a) Oxidation numbers
 - 1) Use in nomenclature
 - 2) Identifying reducing agents and oxidizing agents
 - b) Electrolytic and Voltaic Cells

B. Laboratory

A minimum of eight laboratory experiments are to be conducted during the semester. The list of experiments (or a reasonable substitute) is indicated below. Additional laboratory activities are strongly recommended. Laboratory experiments can also be obtained from Falcon Chemistry (the computer-based experiments available on the MCCC network) and the Vernier computer technology equipment available in room SC 312.

- 1) Preparation of oxygen
- 2) Reactions Heats (Computer Assisted)
- 3) Lewis structures and molecular models
- 4) Density
- 5) Decomposition of a hydrate
- 6) Decomposition of potassium chlorate
- 7) Double replacement reactions-single replacement rxn
- 8) Chemical Reactions and Chemical Equations

LEARNING MATERIALS:

Textbook:

Hein, Pattison, Arena. (2012). *Introduction to General, Organic, and Biochemistry* (10th ed.). John Wiley & Sons, Inc.

Laboratory Manual:

Hein, Peisin, Ritchey. (2012).

