CHM 101 General Chemistry I 2 + 1 +0 (3 Credits)

Physical quantities and Units: The Physical quantities understood as consisting of numerical magnitude and unit. International system of units: Base units, mass length, time current amount of substance. Other units expressed as products or quotients of base units.

Relative Masses of Atoms and Molecules: Relative atomic, isotopic, molecular and formula masses. The mole concepts and the Avogadro constant. Determination of relative masses. Calculation of empirical and molecular formulae.

Atomic and Nuclear basis: Evidence of atomic constituents. Electron, Proton and neutrons – their relative charges and masses. The nucleus, atomic number, mass isotopes and mass spectra. The electronic structure of the atom. Radioactivity; X-ray radiation and detection. Nuclear transformation and binding energy. Nuclear reaction and stability. Application of radionuclides, electromagnetic radiation, wavelength and frequency. Radiation as energy, the planks relation, region of electromagnetic spectrum absorption and emission of radiation. Wave particle dualism and the de Broglie equation treated symbolically. Heisenberg uncertainty principle. Energy levels in atomic hydrogenand their quiantum numbers . ionization energy. The size, shape and orientation of atomic orbitals. Radical and pola diagrams and the effect of nuclear charge. The electron and nuclear spin, - the spin gerlach experiment. Many electron atoms, electron configuration and pauli principle. Hunds rule.

The periodic table, concept of hybridization. The shape of simple molecules including CO_2 linear, CH_4 tetrahedral, NH_3 pyramidal, H_2O non linear, SO_2 trigonal, SF_4 octahedral. Mettalic bonds, intermolecular bods. Hydrogen bonding and its influence on properties. States of matter.