



Code	Subject Title	Cr. Hrs	Semester
CHEM-301	Physical Chemistry	4	V
Year	Discipline		
3	Chemistry-I, II		

SYLLABUS OUTLINE:**1. Electrochemistry:**

Idea of conductance of electrolytes, Deby-Huckle equation and limiting law, ionic strength, weak electrolyte and Deby-Huckle theory, Activity and activity coefficients of electrolytic solution, determination of activities, concentration cells, Types of concentration cells, derivation of E.M.F of concentration cells with and without transference, Fuel cells and hydrocarbon cells.

2. Quantum Chemistry:

Postulates of quantum theory, Eigen functions, operators, Schrödinger's wave equation, particle in one dimensional box, Normalized wave function and orthogonality, Quantum mechanical tunneling, motion of particle in three dimensional box and idea of degeneracy, separation of variables and derivation of quantum numbers, Mathematical treatment of rigid rotator and calculation of bond length of simple molecules, harmonic oscillator and calculation of bond length of simple molecules, harmonic oscillator and calculation of vibrational frequencies, formation of covalent bond, Mathematical treatment of He_2^+ and H_2 molecules, discussion of overlapping integrals, molecular orbital theory and formation of H_2 and O_2 molecules.

3. Chemical kinetics:

Concept of rate law and order of reaction, Kinetics of 3rd order reaction with different concentrations and molecular identity, kinetics of opposing, parallel and consecutive reactions, basic experimental methods, Kinetics of thermally excited chain reactions like reaction of H_2 and Br_2 , kinetics of thermal decomposition of ozone, N_2O_5 and CH_3CHO .

RECOMMENDED BOOKS:

1. Physical Chemistry, Samuel Glasstone, 1995. Macmillan and Co. Ltd. St. marlins Street, London.
 2. Principles of Physical chemistry, Maron and Prutton, 1965 the Macmillan Company, Collier Macmillan Ltd. London.
 3. Physical Chemistry, Barrow, 1973, McGraw Hill, Tokyo.
 4. Physical Chemistry, Moore, 1972, Rentice Hall, Englewood cliffs, Jersey.
 5. Physical Chemistry, Alberty and Daniels, 1962, McGraw Hill Book Company Ltd London.
 6. Physical chemistry, Alkins, 1989, Oxford University Press, Walton Street, Oxford.
- Physical Chemistry, Castallan, 1972, Addison Westey Publishing Company, Menla Park, California, London.