REFERENCES:

1.Practical Organic Chemistry-F .G. Mann and B. C. Saunders (ELBS, England), 2001.

2. Practical Organic Chemistry - A. I. Vogel (Longman-ELBS, England), 1971.

3. Experimental Organic Chemistry–Vol.I&II Singh et al(TMH, New Delhi)1981.
4. Semimicro Qualitative Organic Analysis–Cheronis etal Wiley-Eastern, New Delhi) 1964.

5. Vogel's Text Book of Practical Organic Chemistry Including Qualitative Organic Analysis- B. S. Furniss *et al* (Longman-ELBS, England), 1978.

6. Manual of Organic Chemistry - Dey and Seetharaman.

7. Modern Experimental Organic Chemistry-John H. Miller and E.F. Neugil.

CH P 459: PHYSICAL CHEMISTRY PRACTICALS- II
(At least 12 experiments are to be carried out)

COURSE OUTCOME:

- In continuation with the practical course introduced in the first semester, this course provides opportunity to students to test the concepts learnt in the basic physical chemistry course CH H 403.
- Experiments have been designed on thermodynamics, kinetics, surface and interface chemistry. With the training gained.
- Students will be able to handle issues related to metallurgical processes, waste water treatment, energy efficient processes, action of soaps and detergents etc.

1. Determination of cryoscopic constants of solvents and molecular weight of non volatile substances by thermal method.

2. Determination of degree of dissociation, Vant Hoff factor and molecular weight of an electrolyte by cryoscopy method using copper calorimeter/Dewar flask..

3. Heat of solution of a sparingly soluble compound in water by solubility method.

4. Phase diagram of two component systems by thermal analysis.

5. Phase diagram of three component system (a) 3 liquids with single binodal curve, and b) two liquids and one solid

6.Kinetics of acid catalyzed hydrolysis of methyl acetate and determination of (a) order and rate constant and (b) Energy of activation.

7. Determination of a) Energy of activation & b) rate constant for the First and second order kinetics of reaction between potassium persulphate and potassium iodide.

8. Kinetics of sodium formate – iodine reaction.

9. Determination of the latent heat of evaporation of carbon tetrachloride.

10. Preparation of colloidal solutions.

11. Verification of F & L adsorption isotherms for acetic acid on activated charcoal.

12. To study the adsorption of iodine on charcoal from alcoholic solution.

13. To study the effects of gelatin solution on the precipitation values.

14. Comparison of detergent action of detergents and determination of interfacial tension.

15. Thermodynamic prediction and measurement of the solubility of naphthalene in benzene.

Study of association of benzoic acid in benzene/toluene. Any other relevant experiments of interest.

REFERENCES:-

1. Practical Physical Chemistry- B Viswanathan & P.S Raghavan,(ViVa Books, Delhi) 2005.
2. Findlay's Practical Physical Chemistry- B. P. Levitt (Longman, London).
3. Experiments in Physical Chemistry– James and Prichard.
4. Experimental Physical Chemistry - Daniels et al.
4. Experimental Physical Chemistry-Das & Behera (Tata McGraw Hill, New Delhi)1983.
5. Advanced Practical Physical Chemistry–Yadav (1989).
6. Experiments in Physical Chemistry–J. C. Ghosh (Bharathi Bhavan)1974.

3rd SEMESTER

CH H 501: COORDINATION CHEMISTRY

COURSE OUTCOME:

- The students will learn spectral properties of complexes, interpretation of spectra
- Photochemistry of metal complexes, Magnetic behavior of metal complexes,
- Spectral applications of coordination compounds,
- Reactions mechanisms in Transition metal complexes, Electron transfer reactions.

UNIT- I: **[15 Hours]**

Spectral properties of complexes: Term symbols for d^n ions, spectroscopic ground states, selection rules, nature of spectral bands- band shapes, band intensities, band widths, spin-orbit coupling, vibrational structures.

Orgel diagrams, Tanabe-Sugano diagrams, interpretation of spectra of octahedral, distorted octahedral, tetrahedral and square planar complexes, Determination of o from spectra. Charge transfer bands – origin, types, and characteristics. Photochemistry of metal complexes- photosubstitution and photoredox reactions, ligand photoredox reactions, photoreactions and solar energy conversion.

UNIT- II: **[15 Hours]**

Type of magnetic behaviour, orbital contribution, spin orbit coupling, spin cross-over systems. Measurement of magnetic susceptibility – Gouy and Faraday methods, diamagnetic corrections, ferro- and antiferromagnetic coupling, super paramagnetism. High and low spin equilibria. Magnetic properties of lanthanides and actinides. Infrared spectra of metal complexes, Group frequency concept. Changes in ligand vibrations on coordination- metal ligand vibrations. Spectral applications of coordination compounds - IR spectra of metal