SARDAR PATEL UNIVERSITY
Programme & Subject: M.Sc (Organic Chemistry)
Semester: IV
Syllabus with Effect from: June - 2013

Paper Code: PS04ECHE03	**Total Credit: 4**
Title Of Paper: Selected Topics in Physical Chemistry - II	

Unit	Description in detail	Weightage (%)
I	Dissolution process of polymers, Characteristics of polymer solution, Significance of thermodynamic parameters for solubility of polymer, Classification of polymer solutions, Formulation of ΔG for ideal polymer solution Flory's Guggenehim's and Zimm's treatment to athermal polymer solution in order to formulate ΔG, ΔS and $\Delta \mu$.	25%
II	Formulation of ΔH of mixing for regular solution due to Hilderbrand and Scott, Flory – Huggins theory for general (real) polymer solution, Stability, phase separation and phase diagrams for real polymer solution, Evaluation of critical parameters for real polymer solution, Evaluation of interaction parameter χ and Θ-temperature, The use of vapor pressure and Osmotic pressure measurements for determination of A_2 and hence χ.	25%
III	Statistics of real polymer chain for infinitely dilute solutions, Instantaneous configurational energy, partition function and distribution functions, Bond probability, Random – flight, smoothed – density spherical and smoothed – density ellipsoidal models. Markoffian and non-Markoffian chains, Flory's two parameters theory of excluded volume parameter, Perturbation theories of excluded volume parameter .	25%
IV	Approximate closed expressions of excluded volume : Bueche-James, Flory, Kurata-Stockmager-Roig and Kurata theories based on random flight, smoothed – density spherical and smoothed-density ellipsoidal models for unperturbed and fully perturbed states. Differential equation approach : Fixman, Ptitsyn and Yamakawa – Tanaka theories. Interpretation of experimental Result : Determination of basic parameters for polymer chain, correlation between expansion factor, Second – Virial coefficient, viscosity, excluded volume effect and molecular weight of polymer.	25%

Basic Text & Reference Books:-

- Polymer Solutions. H. Tompa, Butter Worths Scientific Publications, London
- Modern Theory of Polymer Solution H. Yamakawa, Harper and Row Publishers, New York