

## BS (4 Years) for Affiliated Colleges



Code	Subject Title	Cr. Hrs	Semester
<b>CHEM- 404</b>	<b>Physical Chemistry (Sp. Theory-II)</b>	<b>4</b>	<b>VII</b>
Year	Discipline		
<b>4</b>	<b>Chemistry</b>		

### **SYLLABUS OUTLINE:**

#### **1. Rotational and Vibrational Spectroscopy**

Special regions and classification of spectroscopy; Rotational energies of diatomic molecules, population of Rotational energy level. Rotational spectra of rigid linear molecules and determination of bond lengths. The Stark effect.

Vibrational spectroscopy: energy of an atomic molecule, harmonic and harmonic oscillator molecules, relative population of energy levels and intensities of transition, types of vibrational modes.

Vibrational of polyatomic molecules, interpretation of IR spectra of simple molecules, Fermi resonance, applications and sampling techniques.

#### **2. Photo Chemistry:**

Laws of photochemistry, quantum efficiency and its determination Photochemical reactions, excited state symbols; photosensitized reactions, phosphorescence, fluorescence, chemiluminescence, Lasers.

#### **3. Advanced Treatment of Solutions:**

The thermodynamic properties of solution. The solution process. Conditions of equilibrium between phases. Theoretical basis of Raoult's equation. Deviation from ideal behavior. Compound formation and association. Separation of solid solutions.

### **RECOMMENDED BOOKS:**

1. Physical Chemistry by Kundu, N and Jain, S.K.S. Chand and Company Ltd. 1984.
2. Fundamentals of chemical kinetics by Logan, S.R, Longman Group Ltd. 1996.
3. Elementary reaction kinetics by Latham.J.L. And Burgess, A.E.3rd Ed., Butterworths, London, 1977.
4. Physical chemistry by Atkins, P.W. 5th Ed., W.H.Freeman and Company, New York, 1994.
5. Physical Chemistry by Alberty, R.A. and Silbey. R.J., John Wiley, New York, 1995.
6. Physical chemistry by Engel, T. and Ried, P., 1st Ed., Pearson Education, Inc. 2006.
7. Hand book of surface and Colloid Chemistry by Birdi, K.S., CRC Press, 1997.
8. Heterogeneous Catalysis: Principles and applications by Bond, G.C., 2nd Ed., Oxford, Clarendon press, 1987.
9. Surfactants and interfacial Phenomena by Rosen, Milton J., John Wiley, New York, 1978.