B. P. Poddar Institute of Management & Technology

Department of Computer Science & Engineering

Semester: Even

COURSE DATA SHEET

Faculty Name: Dr. Rupa Pal

PROGRAM: Computer Science & Engineering	**DEGREE: B. Tech**
COURSE TITLE : Chemistry-I	**SEMESTER: 2nd**
COURSE CODE : BS-CH201	**SECTION: A**
CATEGORY : Basic Science	**CREDITS: 4**
CONTACT HOURS/WEEK: 3(Lectures) +1 (Tutorial)	

MODEL LESSON PLAN

Unit	Name of the Topic	CO's	No. of Lecture
1	*Atomic and molecular Structure*	COI	10
2	*Spectroscopic techniques and applications*	CO3	8
3	*Intermolecular forces*	CO1	4
4	*Use of free energy in chemical equilibrium*	CO2	8
5	*Periodic properties*	CO4	4
6	*Stereochemistry*	CO5	4
7	*Organic reaction and synthesis of drag molecules*	CO6	4

LESSON PLAN

S N	Topics to be covered	Teaching Aids	Reference
	Unit-1: Atomic and molecular Structure		
L1	Schrodinger equation	Chalkboard	T2
L2	Particle in 1D box solution and their applications	Chalkboard	T2
L3	Molecular orbital theory for some diatomic molecules.	ppt	T2,T3
L4	Pi-molecular orbital diagram of butadiene and benzene, aromaticity	Chalkboard & ppt	T2,T3
L5	Crystal field theory for transition metal ions.	Chalkboard & ppt	T1,T2
L6	Energy level diagram of transitional metal ions & magnetic properties	Chalkboard	T1
L7	Band structure of solid & role of doping.	Chalkboard	T9,T10
	Unit-2: Spectroscopic techniques and applications		
L8	Principle of spectroscopy & selection rule	Chalkboard& ppt	T4, T3
L9	Electronic &UV spectroscopy.	Chalkboard& ppt	T4, T3
L10	Vibrational and rotational spectroscopy.	Chalkboard& ppt	T4, T3
11	Fluorescence and its applications in medicine,	Chalkboard& ppt	T4, T3
12	NMR spectroscopy	Chalkboard& ppt	T4, T3
13	Surface characterizations techniques	Chalkboard& ppt	T4, T3

Unit-3: Intermolecular forces			
14	Ionic, dipolar and van Der Waals interactions	Chalkboard	T2, T3
15	Equation of state of real gases and critical phenomenon	Chalkboard	T2, T3
Unit-4: Use of free energy in chemical equilibrium			
16	First and second law of thermodynamics & their functions.	Chalkboard	T9, T10
17	Estimation of entropy and free energies	Chalkboard	T9, T10
18	Cell potential, Nernst equation and applications	Chalkboard	T9, T10
19	Acid-base, oxidation-reduction & solubility equilibrium	Chalkboard	T6, T7
20	Water chemistry,	Chalkboard	T6, T7
21	corrosion, Ellingham diagrams		T6, T7
Unit-5: Periodic properties			
22	Effective nuclear charge, variations of s, p, d, f orbital energy of atoms in periodic table.	Ppt presentation	T1, T3
23	Electronic configuration, ionic size, ionization energy, electron affinity, ionization energy, polarizability	Ppt presentation	T1, T3
24	Co-ordination compound, HSAB concept	Ppt presentation	T1, T3
25	VSEPR theory and molecular geometry	Ppt presentation	T1, T3
Unit-6: Stereochemistry			
26	Representation of 3D structures, structural isomer & stereoisomer	Chalkboard	T3, T5
27	Configurations, symmetry and chiralityof molecule	Chalkboard	T3, T5
28	optical activity, enantiomers, diastereomers	Chalkboard	T3, T5
29	Absolute configurations, conformational analysis and isomerism in transitional metal compounds	Chalkboard	T3, T5
Unit-7: Organic reaction and synthesis of drag molecules			
30	Reaction mechanism: substitution, addition reactions	Chalkboard	T8, T9,T10
31	Elimination (E1 and E2) reactions	Chalkboard	T8,T9, T10
32	Oxidations and reductions, cyclization and ring opening	Chalkboard	T3, T8
33	Synthesis of some commonly used drag molecules	Chalkboard	T3

Reference books:

T1: Concise Inorganic Chemistry, 4th edition, J.D. Lee, Chapman & Hall

T2: Physical Chemistry, P. C. Rakshit, Sarat Book House.

T3: Engineering Chemistry, Rath and Chakraborty

T4: Fundamental of molecular spectroscopy, by C. N. Banwell

T5: Stereochemistry of Organic Cmpounds, by D. Nasipuri.

T6: Jain & Jain, engineering Chemistry, 15th edition,Dhanpat Rai Publishing Company,2008.

T7: Shashi Chawla, A Text book of Engg Chemistry, Dhanpat Rai & Company, 2003.

T8: Peter Sykes, A Guidebook Mechasnism in Organic Chemistry, 6th edi.Orient Longman.

T9: S.Bandyopadhyay & N.K.Hazra, Fundamentals engg chemistry, Chhaya PrakashaniPvt.Ltd.

T10: Gourkrishna Dasmohapatra, Engineering Chemistry, 2nd edition, Vikas Publication.

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Signature of Faculty