Lesson Plan

Name of Institute : Ambala College of Engineering and Applied Research, Devsthali.

Name of the Faculty member : Dr. Monica Khanna

Discipline : Applied Sciences and Humanities

Semester : 2nd

Subject : Chemistry BS-101A

Chemistry Lab BS-103LA

Lesson Plan Duration : 15 weeks (from January 2020-April, 2020)

Work Load : L-3, T-1, P-3

Week	Theory		Practical	
	Lecture day	Topic (including assignment/ test)	Practical day	Topic
1st	1st	Molecular orbitals of diatomic molecules (N_2, O_2, CO).	1st	To determine the temporary& permanent hardness of a given water sample by EDTA method
	2nd	Equations for atomic and molecular orbitals. Energy level diagrams of diatomics.		
	3rd	Pi-molecular orbitals of butadiene and benzene		
2nd	4th	Aromaticity.	2nd	To determine the calcium & magnesium hardness of a given water sample by EDTA method
	5th	Crystal field theory		
	6th	Energy level diagrams of $[Co(NH_3)_6]$, $[Ni(CO)_4]$, $[PtCl_2(NH_3)_2]$		
3rd	7th	Magnetic properties of metal complexes.	3rd	To determine the alkalinity of a given water sample
	8th	Band structure of solids & Role of doping on band structures		
	9th	Doubts and Test (Crystal Field Theory)		
4th	10th	Principles of spectroscopy and selection rules.	4th	To determine the amount of dissolved oxygen present in a given water sample
	11th	Electronic spectroscopy (basic concept).		
	12th	Fluorescence and its applications in medicine.		
5th	13th	Vibrational spectroscopy of diatomic molecules. Applications.	5th	Viva Voce
	14th	Rotational spectroscopy of diatomic molecules. Applications.		

	15th	**Basic concepts of Nuclear magnetic resonance**		
6th	**16th**	**Basic concepts of Magnetic resonance imaging,**	**6th**	**Using Redwood Viscometer find out the viscosity of an oil sample**
	17th	**Diffraction & Scattering**		
	18th	**Doubts and Test (Spectroscopy)**		
7th	**19th**	**Thermodynamic functions**	**7th**	**To determine the relative viscosity of a given liquid using Ostwald's viscometer**
	20th	**Estimation of Energy**		
	21st	**Estimation of Entropy**		
8th	**22nd**	**Free energy and emf. Cell potentials,**	**8th**	**To determine the total iron content present in a given iron ore solution by redox titration**
	23rd	**The Nernst equation and applications.**		
	24th	**Test(Thermodynamics)**		
9th	**25th**	**Effective nuclear charge, penetration of orbitals.**	**9th**	**Determination of the strength of a given HCl solution by titrating it with standard NaOH solution using conductometer**
	26th	**Variations of s, p, d and f orbital energies of atoms in the periodic table,**		
	27th	**Electronic configurations, atomic and ionic sizes.**		
10th	**28th**	**Ionization energies, electron affinity and electronegativity, polarizability,**	**10th**	**Viva Voce**
	29th	**Oxidation states, coordination numbers and geometries**		
	30th	**Hard soft acids and bases, molecular geometries (H_2O, NH_3, PCl_5, SF_6, CCl_4, $Pt(NH_3)_2Cl_2$ Test**		
11th	**31st**	**Representations of 3 dimensional structures,**	**11th**	**Determination of the strength of a given HCl solution by titrating it with standard NaOH solution using pH meter**
	32nd	**Structural isomers**		
	33rd	**Stereo isomers**		
12th	**34th**	**Configurations and symmetry**	**12th**	**Synthesis of a drug Paracetamol**
	35th	**Chirality**		
	36th	**Enantiomers, diastereomers,**		
13th	**37th**	**Optical activity**	**13th**	**Synthesis of a drug Aspirin**
	38th	**Absolute configurations & Conformational analysis**		

	39th	Doubts and Test (Stereo chemistry)		
14th	40th	Introduction to reactions involving substitution,	14th	Internal Viva
	41st	Addition, Elimination reactions		
	42nd	Oxidation, Reduction reactions.		
15th	43rd	Cyclization and Ring openings reactions.	15th	Doubts/Revision
	44th	Synthesis of Paracetamol & Aspirin		
	45th	Doubts and Test (Reactions)		

Dr. Monica Khanna

Associate Professor

APS Department

ACE

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Syllabus for Sessionals

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Aromaticity.
Crystal field theory
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Magnetic properties of metal complexes.
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Electronic spectroscopy (basic concept).
Fluorescence and its applications in medicine.
Vibrational spectroscopy of diatomic molecules. Applications.
Rotational spectroscopy of diatomic molecules. Applications.
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Basic concepts of Magnetic resonance imaging,
Diffraction & Scattering
Thermodynamic functions
Estimation of Energy
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Free energy and emf. Cell potentials,
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Effective nuclear charge, penetration of orbitals,
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Electronic configurations, atomic and ionic sizes,
Ionization energies, electron affinity and electronegativity, polarizability,
Oxidation states, coordination numbers and geometries
Hard soft acids and bases, molecular geometries (H_2O, NH_3, PCl_5, SF_6, CCl_4, $Pt(NH_3)_2Cl_2$)
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Structural isomers
Stereo isomers

Configurations and symmetry
Chirality
Enantiomers, diastereomers,
Optical activity
Absolute configurations & Conformational analysis

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