AMBALA COLLEGE OF ENGINEERING AND APPLIED RESEARCH, AMBALA
Department of Applied sciences and Humanities

Subject: Engineering Chemistry	**Semester: 2nd**
Subject Code: B24-BSC-104	**Lecture per Week: 03**
External Examination marks: 70	**Tutorials per Week: 01**
Internal Examination Marks: 30	**Practical: 02**

Lesson Plan

Name of Faculty: Dr. Anjana Kumari Discipline: B.Tech

Semester : 2nd Subject : Engineering Chemistry,

Subject Code:(B24-BSC-104)

Lesson Plan Duration: 15 Weeks (From January-May, 2026)

Workload (Lecture/week (in hours): L-3, T-1, P-2

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 alkalinity of the given a 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 viscosity coefficient of the given liquid by using Oswald's viscometer.
	11th	Electroic Spectroscopic (Basic concept)		
	12th	Fluorescence and its application in medicines		
5th	13th	Vibrational spectroscopy of diatomic molecules and applications.	5th	Viva Voce-1
	14th	Rotational spectroscopy molecules and its application.		
	15th	Basic concepts of Nuclear magnetic resonance		
6th	16th	Basic concepts of Magnetic resonance imaging,	6th	To determine the surface tension of a given liquid at room temperature by means of a stalgmometer by drop method.
	17th	Diffraction & Scattering		
	18th	Doubts and Test (Spectroscopy)		
7th	19th	Thermodynamic functions	7th	Determination of viscosity of lubricant by Redwood viscometer (No. 1 and No.2)
	20th	Estimation of Energy		
	21st	Estimation of Entropy		
8th	22nd	Free energy and emf. Cell potentials,	8th	To determine sponification value/ number of the given oil sample.
	23rd	The Nernst equation and applications.		
	24th	Test(Thermodynamics)		
9th	25th	Chemical potential, Clausius – Clapeyron equation and its application	9th	Viva Voce-2
	26th	Numerical problems Clausius – Clapeyron equation		
	27th	Phase rule and derivation of phase rule equation		
10th	28th	Terms involved in phase rule (phase, component, degree of freedom)	10th	Synthesis of a drug of Aspirin
	29th	One component system (Water system)		
	30th	Two component system (Lead- silver system)		

11th	31st	Application of phase equilibria	11th	To prepare M/20 solution of Mohr's salt and, using this solution find out the molarity and strength of the given potassium permanganate (KMnO4) solution.
	32nd	Introduction of corrosion		
	33rd	Introduction of Galvanic cell		
12th	34th	Types of Galvanic cell (Chemical and concentration cell	12th	Revision of Experiments
	35th	Introduction and examples of Cell potentials		
	36th	Nernst equation and its applications		
13th	37th	Numerical problem of Nernst equation and its applications	13th	Internal Viva
	38th	Types of corrosion (Dry and wet corrosion)		
	39th	Electrochemical theory of corrosion		
14th	40th	Bimetallic corrosion and Pitting corrosion	14th	Internal Viva
	41st	Differential aeration corrosion, water -line corrosion		
	42nd	Factors affecting corrosion rate, preventive measures of corrosion (design of material, anodic and cathodic protection and protective covering)		
15th	43rd	Revision of Unit-I	15th	Doubts/Revision
	44th	Revision of Unit-II		
	45th	Revision of Unit-III and Revision of Unit- IV		

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