VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY, BURLA

LESSON PLAN

Semester: **1st and 2nd** Subject: **Chemistry**

Session: Odd and Even **Theory**/Sessional

Branch/Course: **B.Tech. (All Branches)**

Period	Module/ Number	Topics to be Covered	Remarks/Sign. of Faculty Member
1	**I**	Failure of Classical Mechanics, Maxwell Theory of Radiation, Blackbody Radiation, Fundamental Laws of Blackbody Radiation, Planck's Quantum Theory	
2	**I**	Photoelectric Effect, Dual Nature of Matter, de Broglie Equation, Heisenberg's Uncertainty Principle	
3	**I**	Schrödinger's Wave Equation (Derivation not required), Laplacian Operator, Hamiltonian Operator, Significance of Wave Function, Eigen Value and Eigen Functions	
4	**I**	Particle in 1D Box, Normalisation and Orthogonality of Eigen Function of Particle in ID Box, Energy for 1D Potential Box, Characteristic Features of E_n of the Particle in ID Box	
5	**I**	Electromagnetic Spectrum, Interaction of Wave with Matter, Basic Concept of Spectroscopy	
6	**I**	Microwave or Rotational Spectroscopy (Introduction, Basic Principle, Rotation of Molecules, Intensities of Spectral Lines)	
7	**I**	Microwave or Rotational Spectroscopy (Rigid Diatomic Molecules, Selection Rule, Effect of Isotopic Substitution)	
8	**I**	Infrared or Vibrational Spectroscopy (Introduction, Basic Principles, Simple Harmonic Oscillator, Selection Rule)	
9	**I**	Infrared or Vibrational Spectroscopy (Vibration of Polyatomic molecule (Elementary Idea), Fingerprint Region)	
10	**I**	Ultraviolet-Visible or Electronic Spectroscopy (Fundamental Laws of Absorption (Lambert's and Beer's Law), Basic Principle, Different Types of Transitions, Selection Rule)	
11	**II**	Ultraviolet-Visible or Electronic Spectroscopy (Frank-Condon Principle, Jablonski Diagram, Concept of Absorption, Fluorescence, Phosphorescence	
12	**II**	Concept of Entropy, Thermodynamic Derivation of Entropy, Entropy of Reversible and Irreversible Process, Entropy Change for Ideal Gases	
13	**II**	Concept of Free Energy, Gibbs-Helmholtz equation, vant Hoff's Equation, Partial Molar Quantities	
14	**II**	Chemical Potential, Gibbs-Duhem Equation, Variation of Chemical Potential with Temperature and Pressure, Chemical Potential of Ideal Gases	
15	**II**	Clausius-Clapeyron Equation , Maxwell Relations	
16	**II**	Definition of Terms: Phase, Components, Degree of Freedom, Phase Rule Equation	
17	**II**	Phase Diagrams of one Component Systems: Water System	
18	**II**	Phase Diagrams of Sulphur System, Condensed Phase Rule	
19	**II**	Phase Diagram of two Component System: Lead-Silver	

		System, Eutectic and Peritectic point	
20	**II**	Cooling Curves, Phase Diagram of Iron-Carbon System	
21	**III**	Electrode Potentials and its Relevance to Oxidation and Reduction Reaction	
22	**III**	Measurement of Electrode Potential, Nernst Equation, Electrochemical Series	
23	**III**	Measurement of Electrode and Cell Potential	
24	**III**	Determination of p^H by using Hydrogen, Quinhydrone	
25	**III**	Determination of p^H by using Glass Electrodes	
26	**III**	Battery, Types of Batteries, Dry Cell, Storage Cell	
27	**III**	Fuel Cell, Types of Fuel Cells, H_2-O_2 Fuel Cell	
28	**III**	Concept to Corrosion, Dry and Wet Corrosion, Galvanic corrosion	
29	**III**	Elementary Idea About Order and Molecularity of Reactions	
30	**III**	1^{st} Order Kinetics, Half-Life Period	
31	**IV**	Kinetics of Reversible Reactions	
32	**IV**	Kinetics of Consecutive Reactions	
33	**IV**	Kinetics of Parallel Reactions	
34	**IV**	Steady State Approximation, Examples of Type I and II	
35	**IV**	Steady State Approximation, Examples of Type III and IV	
36	**IV**	Chain Reactions ((Rice-Hertz Field Mechanism)	
37	**IV**	Applications of Organometallics	
38	**IV**	Applications of Organometallics	
39	**IV**	Classification of Nanomaterials	
40	**IV**	Application of Nanomaterials	

Signature of Faculty:

Date: **Counter Signature of H.O.D.**