

Lesson Plan

Dr. B.R. Ambedkar Govt. College, Dabwali

Name of the Assistant Professor:-Jaswinder Singh

Class and Section:-B.Sc. I (NM)/II Semester Session-2023-24

Subject:- Chemistry

Month	Topics
January	Physical Chemistry, Chapter- Chemical Kinetics
	○ Rate of reaction, rate equation and its types, factors influencing the rate of a reaction – concentration, temperature, pressure solvent, light, catalyst
	○ Rate Law and Order of a reaction, Characteristics of rate constant,
	○ integrated rate expression for zero order, Examples of zero order reactions
	○ Half life period of zero order reactions and graphical representations
	○ integrated rate expression for first order, Examples of first order reactions
	○ Half life period of first order reactions and graphical representations
	○ Numerical problems related to first order reactions, pseudofirst order reactions
	○ integrated rate expression for second order, Examples of second order reactions and graphical representations
	○ Half life period of second order reactions and Integrated rate expression for third order reactions
	○ Order and molecularity of reactions and methods to determine the order of reactions
	○ methods to determine the order of reactions and effect of temperature on reaction rates
	○ Arrhenius equation and numerical problem related to energy of activation
February	○ Theories of reaction rate– Simple collision theory for uni molecular collision
	○ Lindemann mechanism for unimolecular reactions
	○ Transition state theory/Activated complex formation theory of bimolecular reactions.
	Topic- Electrochemistry Electrolytic conduction, factors affecting electrolytic conduction, Introduction to basic terms like conductance, resistance, resistivity and cell constant
	○ Variation of specific, equivalent and molar conductance with dilution
	○ Arrhenius theory of ionization and its limitations
	○ Ostwald dilution law and debye-Huckel theory
	○ Transport Numbers and Hittorf's Method
	○ Factors affecting Transport Numbers and Moving Boundary method
	○ Kohlrausch Law and Its applications
	○ Conductometric Titrations
	○ pH and Buffer Systems
March	Chapter:-Hydrogen Bonding and Van der Waals forces
	Hydrogen Bonding – Definition, types, effects of hydrogen bonding on properties of substances Brief discussion of various types of Van der Waals forces
	Chapter:-Metallic Bonding
	○ Metallic bond – explanation based on valence bond Theory.
	○ Band theories of metallic bond (conductors, semiconductors, insulators), Semiconductors
	Chapter :- s-Block elements
	○ Physical Properties of alkali metals and alkaline earth metals
	○ Physical Properties of alkali metals and alkaline earth metals
	○ Chemical properties-Action with Air, water
	○ Chemical properties of alkali metals – action with halogens, hydrogen and liquid ammonia
	○ Anomalous behaviour of Lithium and Beryllium compared to other elements in the same group, diagonal relationship
	○ Solvation and Complexation tendencies of s-block elements, ionic mobility
○ Crown ethers and cryptands,	
April	○ Role of s-block in biological systems
	Chapter-Chemistry of Noble Gases
	○ Physical and Chemical Properties of Noble Gases
	○ Compounds of Xenon
	○ Revision of Important topics related to Physical And Inorganic Chemistry



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Name of the Assistant Professor:-Jaswinder Singh

Class and Section:-B.Sc. II (NM)/IV Semester Session-2023-24

Subject: - Chemistry

Month	Topics
January 2024	Physical Chemistry, Chapter-Thermodynamics
	○ Limitation of first law of thermodynamics
	○ Carnot Cycle
	○ Carnot Cycle
	○ Carnot Theorem and Numerical problems
	○ Entropy change during reversible and irreversible process and clausius inequality
	○ Entropy Change for an ideal gas with change in P,V& T
	○ Entropy change during phase transition and numerical problems
	○ Entropy change during mixing of ideal gases
	○ Work function and Gibbs free energy
	○ Change in work function and Gibbs free energy with T & P
	○ Criteria for spontaneity of a process
	○ Gibbs Helmholtz equation and numerical problems
	○ Nernst heat theorem and third law of thermodynamics
	○ Application of third law of thermodynamics-absolute entropy calculation
○ Residual entropy	
February 2024	Chapter-Electrochemistry
	○ Galvanic cells –introduction
	○ Electrolytic cell
	○ Electrode potential and e.m.f .measurements, Standard cells
	○ Reversible cells and irreversible cells
	○ Reversible cells Types
	○ Reversible cells Types
	○ Calculation of thermodynamic quantities of cell reactions
	○ Standard hydrogen electrode and its uses
	○ Electrochemical Series and its applications
	○ Nernst equation for e.m.f .cell and numerical problems related to Nernst equation
	○ Calculation of equilibrium constant of cell reaction
	○ Overvoltage
	○ Concentration cells-introduction
	○ e.m.f. of electrode conc. Without transference
	○ e.m.f. of electrolyte conc. Without transference
	○ e.m.f. of electrolyte conc. Without transference
	○ liquid Junction Potential
	○ Applications of e.m.f. measurements
	○ Applications of e.m.f. measurements
	○ Applications of e.m.f. measurements
○ Potentiometric titrations	



Month	Topics	
March 2024	<ul style="list-style-type: none"> ○ Inorganic Chemistry ○ Chapter-Chemistry of f-Block elements ○ Lanthanides: Electronic structure, oxidation states ○ magnetic properties, complex formation, color of lanthanides ○ Atomic & ionic radii and lanthanide contraction and its consequences ○ occurrence, separation tech. of lanthanides, ○ Lanthanide compounds, Actinides: General characteristics of actinides ○ chemistry of separation of Np, Pu and Am from uranium ○ Comparison of properties of Lanthanides and actinides with transition elements. ○ Chapter- Theory of Qualitative and Quantitative Analysis ○ Basic of analysis- common ion effect, solubility product etc. ○ chemistry of identification of acid radicals ○ chemistry of identification of acid radicals ○ chemistry of identification of acid radicals ○ chemistry of identification of acid radicals ○ chemistry of identification of acid radicals 	
	April 2024	○ chemistry of identification of acid radicals in typical combination
		○ chemistry of identification of acid radicals in typical combination
		○ chemistry of identification of acid radicals in typical combination
		○ chemistry of identification of acid radicals in typical combination
		○ chemistry of identification of Basic radicals
		○ chemistry of identification of Basic radicals
		○ chemistry of identification of Basic radicals,
		○ Theory of precipitation, co-precipitation, post precipitation
		○ Revision of Important topics related to Physical Chemistry
		○ Revision of Important topics related to Inorganic Chemistry

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Dr. B.R. Ambedkar Govt. College, Dabwali

Name of the Assistant Professor:-Jaswinder Singh

Class and Section:-B.Sc. III (NM)/VI Semester Session-2023-24

Subject:- Chemistry

Month	Topics
January 2024	Physical Chemistry Chapter-Electronic spectrum <ul style="list-style-type: none">○ Theory of electronic band spectra○ Potential energy curves for ground and excited states, Frank condon Principal
	<ul style="list-style-type: none">○ Selection rule for electronic transition in molecules-parity, multiplicity of states, term symbol
	<ul style="list-style-type: none">○ Molecular orbitals involved in electronic transitions
February 2024	Chapter-Photochemistry <ul style="list-style-type: none">○ Photochemical and thermochemical reactions-comparison○ Lambert and beer's law○ Laws of photochemistry○ Numerical problem based on beer's and stark Einstein law, Quantum efficiency and its measurement○ Examples of photochemical reactions○ Jablonski diagram and related phenomenon○ Stern -Volmer equation, Photosensitization and photoinhibitors
	Chapter -solution ,dilute solutions and colligative properties <ul style="list-style-type: none">○ Concentration terms○ Partial molar free energy, Fugacity ,activity and activity coefficients○ Raoult's law○ Ideal and non-ideal solutions ,Thermodynamic properties of ideal solutions○ Deviations from ideal behavior○ Azeotropes, Relative lowering in vapour pressure○ Osmotic pressure and its measurement○ Depression in freezing point, thermodynamic derivation○ Measurement of depression in freezing and elevation in boiling point
	<ul style="list-style-type: none">○ Concept of abnormal molar masses, Vant Hoff factor and its application,○ Meaning of terms-phase, component and degree of freedom○ Thermodynamic derivation of gibb's phase rule○ One component system- water○ Two component system- lead silver system and desilverisation of lead
	<ul style="list-style-type: none">○ Problem discussion and Revision of topics related to physical chemistry
March 2024	
April 2024	