***Govt. College for Women, Sampla (Rohtak)***

***Lesson plan of Even Semester (session 2023-2024)***

**Name of the Faculty : Ms. Monika**

**Course/Class : B.SC- I**

**Semester : Semester-II**

**Subject : Physical Chemistry**

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| **Week/Month** | **Name of Topics** |
| **1st week of Jan** | SECTION-A  Kinetics-I Rate of reaction, rate equation, factors influencing the rate of a reaction – concentration, temperature, pressure, solvent, light, catalyst |
| **2nd week of Jan** | . Order of a reaction, integrated rate expression for zero order, first order, second and third order reaction. Half life period of a reaction. Methods of determination of order of reaction |
| **3rd week of Jan** | SECTION-B  Kinetics-II Effect of temperature on the rate of reaction – Arrhenius equation. |
| **4th week of Jan** | Theories of reaction rate – Simple collision theory for unimolecular and bimolecular collision. Transition state theory of Bimolecular reactions |
| **1st week of Feb** | **SESSINAL 1** |
| **2nd week of Feb** | Section-C  Electrochemistry-I Electrolytic conduction, factors affecting electrolytic conduction, |
| **3rd week of Feb** | specific, conductance, molar conductance, equivalent conductance and relation among them, their vartion with concentration. Arrhenius theory of ionization,) |
| **4th week of Feb** | Ostwald’s Dilution Law. Debye- Huckel – Onsager’s equation for strong electrolytes (elementary treatment only) Transport number, definition |
| **5th week of Feb** | determination by Hittorfs methods, (numerical included |
| **1st week of March** | Section-D  Electrochemistry-II Kohlrausch’s Law, calculation of molar ionic conductance and effect of viscosity temperature & pressure on it. |
| **2nd week of March** | Application of Kohlrausch’s Law in calculation of conductance of weak electrolytes at infinite dilution. Applications of conductivity measurements: determination of degree of dissociation, determination of Ka of acids determination of solubility product of spa ringly soluble salts. |
| **3rd week of March** | conductometric titrations. Definition of pH and pKa, Buffer solution, Buffer action |
| **4th week of March** | HOLI BREAK |
| **1st week of April** | Henderson – Hazel equation, Buffer mechanism of buffer action |
| **2nd week of April** | Sessinal II |
| **3rd week of April** | Revision of Section A and B |
| **4th week of April** | Revision of Section C and D |

**Mr Monika**

**Assistant Professor**

**Department of Chemistry**

***Govt. College for Women, Sampla (Rohtak)***

***Lesson plan of Even Semester (session 2023-2024)***

**Name of the Faculty : Ms. Monika**

**Course/Class : B.SC- II**

**Semester : Semester-IV**

**Subject : Physical Chemistry**

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| **Week/Month** | **Name of Topics** |
| **1st week of Jan** | **Section-A**  Thermodynamics-III Second law of thermodynamics, need for the law, different statements of the law, Carnot’s cycles and its efficiency, Carnot’s theorm, |
| **2nd week of Jan** | Thermodynamics scale of temperature. Concept of entropy – entropy as a state function, entropy as a function of V & T, entropy as a function of P & T. |
| **3rd week of Jan** | entropy change in physical change, entropy as a criteria of spontaneity and equilibrium. Entropy changes in ideal gases and mixing of gases |
| **4th week of Jan** | **Section-B**  Thermodynamics-IV Third law of thermodynamics: Nernst heat theorem, statement of concept of residual entropy, evaluation of absolute entropy from heat capacity data. |
| **1st week of Feb** | Gibbs and Helmholtz functions; Gibbs function (G) and Helmholtz function (A) as thermodynamic quantities, |
| **2nd week of Feb** | A & Gas criteria for thermodynamic equilibrium and spontaneity, their advantage over entropy change. Variation of G and A with P, V and T. |
| **3rd week of Feb** | **SESSINAL 13** |
| **4th week of Feb** | **Section-C**  Electrochemistry-III Electrolytic and Galvanic cells – reversible & Irreversible cells, conventional representation of electrochemical cells. EMF of cell and its measurement, Weston standard cell, activity and activity coefficients. |
| **5th week of Feb** | Calculation of thermodynamic quantities of cell reaction ( G, H & K). Types of reversible electrodes – metal- metal ion gas electrode, metal –insoluble salt- anion and redox electrodes. Electrode reactions, Nernst equations, derivation of cell EMF and single electrode potential. |
| **1st week of March** | Standard Hydrogen electrode, reference electrodes, standard electrodes potential, sign conventions, electrochemical series and its applications |
| **2nd week of March** | **Section-D**  Electrochemistry-IV Concentration cells with and without transference, liquid junction potential,. |
| **3rd week of March** | application of EMF measurement i.e. valency of ions, solubility product activity 20 coefficient, potentiometric titration (acid- base and redox). |
| **4th week of March** | Holi Break |
| **1st week of April** | Determination of pH using Hydrogen electrode, Quinhydrone electrode and glass electrode by potentiometric methods |
| **2nd week of April** | Sessional II |
| **3rd week of April** | Revision of Section A and B |
| **4th week of April** | Revision of Section C and D |

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***Lesson plan of Even Semester (session 2023-2024)***

**Name of the Faculty : Ms. Monika**

**Course/Class : B.SC- III**

**Semester : Semester-VI**

**Subject : Physical Chemistry**

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| **Week/Month** | **Name of Topics** |
| **1st week of Jan** | **Section-A**  Spectroscopy-III Electronic Spectrum Concept of potential energy curves for bonding and antibonding molecular orbitals, |
| **2nd week of Jan** | qualitative description of selection rules and Franck- Condon principle. |
| **3rd week of Jan** | Qualitative description of sigma and pie and n molecular orbital (MO) their energy level and respective transitions. |
| **4th week of Jan** | **Section-B**  Photochemistry Interaction of radiation with matter, difference between thermal and photochemical processes. Laws of photochemistry |
| **1st week of Feb** | : Grotthus-Drapper law, Stark- Einstein law (law of photochemical equivalence) Jablonski diagram depicting various processes occurring in the excited state, qualitative description of fluorescence, phosphorescence, |
| **2nd week of Feb** | non-radiative processes (internal conversion, intersystem crossing), quantum yield, photosensitized reactions-energy transfer processes |
| **3rd week of Feb** | **SESSINAL 1** |
| **4th week of Feb** | **Section-C**  Ideal and non-ideal solutions, methods of expressing concentrations of solutions, activity and activity coefficient. Dilute solution,Colligative properties, Raolut’s law, relative lowering of vapour pressure, molelcular weight determination, |
| **5th week of Feb** | Osmosis law of osmotic pressure and its measurement, determination of molecular weight from osmotic pressure. Elevation of boiling point and depression of freezing point, |
| **1st week of March** | Thermodynamic derivation of relation between molecular weight and elevation in boiling point and depression in freezing point. Experimental methods for determining various colligative properties. Abnormal molar mass, degree of dissociation and association of solutes. |
| **2nd week of March** | **Section-D**  Phase Equillibrium Statement and meaning of the terms – phase component and degree of freedom, |
| **3rd week of March** | thermodynamic derivation of Gibbs phase rule, phase equilibria of one component system –Example – water and Sulpher systems. |
| **4th week of March** | HOLI BREAK |
| **1st week of April** | Phase equilibria of two component systems solid-liquid equilibria, simple eutectic Example Pb-Ag system, desilerisation of lead |
| **2nd week of April** | Sessional II |
| **3rd week of April** | Revision of Section A and B |
| **4th week of April** | Revision of Section C and D |

**Ms. Monika**

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**Department of Chemistry**