**LESSON-PLAN (Session 2020-21) ODD SEMESTER**

**Name of Professor**:Ms. Kavita

**Designation: Assistant professor**

**Subject: Chemistry**

**Class:B.Sc 2nd  ( 3rd sem) Medical & Nonmedical**

**Subject/Paper: Physical Chemistry**

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| **Sr. No.** | **Months** | **Topics to be covered** | **Remarks if any,** |
| **1** | **October** | **Thermodynamics**  Definition of thermodynamic terms: system, surrounding etc. Types of systems, intensive and extensive properties. State and path functions and their differentials. |  |
| **2** | **November** | **Thermodynamics**  Thermodynamic process.Thermodynamic equilibrium, Concept of heat and work.  First law of thermodynamics: statement, concepts of internal energy and enthalpy. Heat capacity, heat capacities at constant volume and pressure and their relationship. Joule–Thomson coefficient for ideal gas and real gas and inversion temperature.Calculation of w,q, dU & dH for the expansion of ideal gases under  isothermal and adiabatic conditions for reversible process. | Assignment and Test |
| **3** | **December** | **Chemical Equilibrium**  Equilibrium constant and free energy, concept of chemi al potential, Thermodynamic derivation of law of chemical equilibrium. Tempe rature dependence of equilibrium constant.Clausius–Clapeyron equation and its applications. | Assignment and Test |
| **4** | **January** | **Distributioln Law**  Nernst distribution law – its thermodynamic derivation, Applicat ions of distribution law: (i) Determination of degree of hydrolysis and hydrolysis constant of aniline hydrochloride (ii )Determination of equilibrium constant of potassium tri –iodide complex **Distributioln Law**  (iii) Process of extraction. **Numerical problems**  **a** | Revision |

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**Name of Professor**:Ms. Kavita

**Designation: Assistant professor**

**Subject: Chemistry**

**Class:B.Sc 2nd  ( 3rd sem) Medical & Nonmedical**

**Subject/Paper: Organic Chemistry**

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| **Sr. No.** | **Months** | **Topics to be covered** | **Remarks if any,** |
| **1** | **October** | **Infrared (IR) absorption spectroscopy**: Molecular vibrations, Hooke's law, selection rules, intensity and position of IR bands, measurement of IR spectrum, fingerprint region, characteristic absorptions of various functional groups and interpretation of IR spectra of simple organic compounds. Applications of IR spectroscopy in structure elucidation of simple organic compounds.  TEST |  |
| **2** | **November** | **Amines**  : Structure and nomenclature of amines, physical properties. Separation of a mixture of primary, secondary and tertiary amines. Structural features affecting basicity of amines. Preparation of alkyl and aryl amines (reduction of nitro compounds, nitriles, reductive amination of aldehydic and ketonic compounds. Gabrielphthalimide reaction, Hofmann bromamide reaction. Electrophilic aromatic substitution in aryl amines, reactions of amines with nitrous acid.  TEST | Assignment and Test |
| **3** | **December** | **Diazonium Salts** : Mechanism of diazotisation, structure of benzene diazonium chloride, Replacement of diazo group by H, OH, F, Cl, Br, I, NO2 and CN groups, reduction of diazonium salts to hyrazines, coupling reaction and its synthetic application  **Aldehydes and Ketones:** Nomenclature and structure of the carbonyl group. Synthesis of aldehydes and ketones with particular reference to the synthesis of aldehydes from acid chlorides, advantage of oxidation of alcohols with chromium trioxide (Sarett reagent) pyridinium chlorochromate (PCC) and pyridinium dichromate. Physical properties, Comparison of reactivities of aldehydes and ketones. | Assignment and Test |
| **4** | **January** | **Aldehydes and Ketones** : Mechanism of nucleophilic additions to carbonyl group with particular emphasis on benzoin, aldol, Perkin and Knoevenagel condensations. Condensation with ammonia and its derivatives. Wittig reaction. Mannich reaction.Oxidation of aldehydes, Baeyer– Villiger oxidation of ketones, Cannizzaro reaction. MPV, Clemmensen, Wolff-Kishner, LiAlH4 and NaBH4 reductions.  TEST  REVISION | Revision |

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**Name of Professor**:Ms. Kavita

**Designation: Assistant professor**

**Subject: Chemistry**

**Class:B.Sc 2nd  ( 3rd sem) Medical & Nonmedical**

**Subject/Paper: Inorganic Chemistry**

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| **Sr. No.** | **Months** | **Topics to be covered** | **Remarks if any,** |
| **1** | **October** | **Chemistry of f-Block elements: Lanthanides:** Electronic structure, oxidation states, magnetic properties, complex formation, colour, ionic radii and lanthanide contraction, occurrence, separation of lanthanides, Lanthanide compounds.  **Actinides:** General characteristics of actinides, |  |
| **2** | **November** | **Actinides:** Chemistry of separation of Np, Pu and Am from uranium, Transuranic elements, comparison of properties of Lanthanides and actinides with transition elements.  **Theory of Qualitative and Quantitative Analysis:** Chemistry of analysis of various groups of basic and acidic radicals, chemistry of identification of acid radicals in typical combination, | Assignment and Test |
| **3** | **December** | **Theory of Qualitative and Quantitative Analysis** : Chemistry of interference of acid radicals including their removal in the analysis of basic radicals, common ion effect, solubility product, theory of precipitation,. | Assignment and Test |
| **4** | **January** | **Theory of Qualitative and Quantitative Analysis** : Co-precipitation, post precipitation, purification of precipitates  **REVISION AND TESTS** | Revision |