**Lesson Plan**

**MCM DAV College for Women, Sector – 36A, Chandigarh**

**Monthly Teaching Plans (Odd Semester)**

**Session – (2020-21)**

**Name of the Teacher/s Ms. Swati Nag**

**Department: Chemistry**

**Class: B.Sc (3rd semester) Subject: Inorganic Chemistry**

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| **S.No.** | **Date**  **(Monthly)** | | **Topics to be Covered** | **Academic Activity Undertaken\*** |
| **From** | **To** |
| 1 | 13.08.2020 | 31.08.2020 | Characteristic Properties of d-block elements | Lecture |
| 2 | 1.09.2020 | 30.09.2020 | Properties of the elements of first transition series, Simple compounds and Complexes | Lecture |
| 3 | 1.10.2020 | 30.10.2020 | Illustrating relative stability of Oxidation States, Coordination number and geometry | Lecture |
| 4 | 3.11.2020 | 28.11.2020 | General characteristic and comparative treatment with 3d-analogues | Lecture and group discussion |
| 5 | 1.12.2020 | 15.12.2020 | Werners theory and its experimental validation, Effective atomic number concept and Chelates | Lecture |
| 6 | 16.12.2020 | 24.12.2020 | Nomenclature and isomerism of Coordination compounds | Group discussion |
| 7 | 1.01.2021 | 15.01.2021 | Valence bond theory of coordination metal complexes and their properties | Lecture |
| 8 | 16.01.2021 | Till exams | Uses of coordination compounds | Lecture and Group discussion |

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| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans** | |
| 7th September, 2020 | The teachers have completed the scheduled chapters and topics as shown in the lesson plan |
| **Departmental Meeting to Coordinate and Review the Monthly completion of**  **Syllabus as per lesson plans** | |
| 5th October, 2020 | The teachers have completed the scheduled chapters and topics as shown in the lesson plan |
| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans** | |
| 3rd November , 2020 | The teachers have completed the scheduled chapters and topics as shown in the lesson plan |
| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans** | |
| 7th December  , 2020 | The teachers have completed the scheduled chapters and topics as shown in the lesson plan |
| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans**   |  |  | | --- | --- | | 4th January, 2021 | The teachers have completed the scheduled chapters and topics as shown in the lesson plan | | |

**\*Any of these** – (i) Lecture Method; (ii) PPT; (iii) Online Sources; (iv) Group Discussion; (v) Case Studies etc.

Other Methods adopted by the teacher – Please write the specific teaching method

**Lesson Plan**

**MCM DAV College for Women, Sector – 36A, Chandigarh**

**Monthly Teaching Plans (Even Semester)**

**Session – (2020-21)**

**Name of the Teacher/s: Ms. Swati Nag**

**Department: Chemistry**

**Class: B.Sc (4th Semester) Subject: Inorganic Chemistry**

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| **S.No.** | **Date**  **(Monthly)** | | **Topics to be Covered** | **Academic Activity Undertaken\*** |
| **From** | **To** |
| 1 | 1.04.2021 | 15.04.2021 | Electronic structure, oxidation states, ionic radii and lanthanide contraction. | Lecture |
| 2 | 16.04.2021 | 30.04.2021 | Complex formation, occurrence and isolation of lanthanides.  General chemistry of actinides. | Lecture |
| 3 | 1.05.2021 | 15.05.2021 | Chemistry of separation of Np,Pu and Am from U.  Similarity between the later actinides and the later lanthanides. | Lecture and Group Disccusion |
| 4 | 17.05.2021 | 31.05.2021 | Arrhenius, Bronsted-Lowry, lux-Flood and solvent system concept. | Lecture |
| 5 | 1.06.2021 | 15.06.2021 | Lewis concept of acids and bases.  Use of redox potential data, analysis of redox cycle and redox stability in water (Frost, Latimer and porbaix diagram). | Lecture |
| 6 | 16.06.2021 | 30.06.2021 | Principle involved in extraction of elements.  Properties and type of solvent, general characteristics of solvent. | Lecture and Group Disccusion |
| 7 | 1.07.2021 | Till exams | Reactions in non aqueous solvent (liquid ammonia and liquid SO2) | Lecture |

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| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans** | |
| 5th April, 2021 | The teachers have completed the scheduled chapters and topics as shown in the lesson plan |
| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans** | |
| 3rd May, 2021 | The teachers have completed the scheduled chapters and topics as shown in the lesson plan |
| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans** | |
| 7th June, 2021 | The teachers have completed the scheduled chapters and topics as shown in the lesson plan |
| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans** | |
| 5thJuly, 2021 | The teachers have completed the scheduled chapters and topics as shown in the lesson plan |

**\*Any of these** – (i) Lecture Method; (ii) PPT; (iii) Online Sources; (iv) Group Discussion; (v) Case Studies etc.

Other Methods adopted by the teacher – Please write the specific teaching method

**Lesson Plan**

**MCM DAV College for Women, Sector – 36A, Chandigarh**

**Monthly Teaching Plans (Odd Semester)**

**Session – (2020-21)**

**Name of the Teacher/s Dr. Swatika Sharma**

**Department: Chemistry**

**Class: B.Sc (3rd semester) Subject: Organic Chemistry**

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| **S.No.** | **Date**  **(Monthly)** | | **Topics to be Covered** | **Academic Activity Undertaken\*** |
| **From** | **To** |
| 1 | 13.08.2020 | 31.08.2020 | Classification and nomenclature Monohydric alcohols-Nomenclature, methods of formation by reduction of aldehydes, ketones, carboxylic acids and esters. Hydrogen bonding. Acidic nature. | Lecture |
| 2 | 1.09.2020 | 30.09.2020 | Reactions of alcohols. Dihydric and Trihydric alcoholsNomenclature, methods of formation, chemical reactions of vicinal glycols and glycerol. Preparation of phenols, physical properties and acidic character. | Lecture |
| 3 | 1.10.2020 | 15.10.2020 | Comparative acidic strengths of alcohols and phenols, resonance stabilization of phenoxide ion. Reactions of phenols-electrophilic aromatic substitution, acylation and carboxylation. Mechanisms of Fries rearrangement, Claisen rearrangement, Gatterman synthesis, and Reimer-Tiemann reaction. | Lecture |
| 4 | 16.10.2020 | 30.10.2020 | Nomenclature and structure of the carbonyl group. Synthesis of aldehydes and ketones with particular reference to the synthesis of aldehydes from acid chorides, synthesis of aldehydes and ketones using 1,3-dithianes, synthesis of ketones from nitriles and from carboxylic acids. Physical properties. | Lecture and group discussion |
| 5 | 3.11.2020 | 28.11.2020 | 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. Use of acetals as protecting group. | Lecture |
| 6 | 1.12.2020 | 15.12.2020 | Oxidation of aldehydes, Baeyer-Villiger oxidation of ketones, Cannizzaro reaction, MPV, Clemmensen, Wolff-Kishner, LiAIH4 and NaBH4 reductions. Nomenclature, structure and bonding, physical properties, acidity of carboxylic acids, effects of substitutions on acid strength. Preparations of carboxylic acids. Reactions of carboxylic acids. Hell-Volhard-Zelinsky reaction. | Group discussion |
| 7 | 16.12.2020 | 24.12.2020 | Synthesis of acid chlorides, esters and amides, Reduction of carboxylic acids. Mechanism of decarboxylation. Methods of formation and chemical reactions of halo acids. Hydroxyl acids: Malic, tartaric and citric acids (structural features only). | Lecture |
| 8 | 1.01.2021 | 15.01.2021 | Methods of formation and chemical reactions of unsaturated monocarboxylic acids. Dicarboxylic acids: Methods of formation and effects of heat and hydrating agents. | Lecture and Group discussion |
| 9 | 16.01.2021 | Till exams | Revision and question answer discussion | Group discussion |

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| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans** | |
| 7th September, 2020 | The teachers have completed the scheduled chapters and topics as shown in the lesson plan |
| **Departmental Meeting to Coordinate and Review the Monthly completion of**  **Syllabus as per lesson plans** | |
| 5th October, 2020 | The teachers have completed the scheduled chapters and topics as shown in the lesson plan |
| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans** | |
| 3rdNovember,2020 | The teachers have completed the scheduled chapters and topics as shown in the lesson plan |
| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans** | |
| 7th December, 2020 | The teachers have completed the scheduled chapters and topics as shown in the lesson plan |
| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans**   |  |  | | --- | --- | | 4th January, 2021 | The teachers have completed the scheduled chapters and topics as shown in the lesson plan | | |

**\*Any of these** – (i) Lecture Method; (ii) PPT; (iii) Online Sources; (iv) Group Discussion; (v) Case Studies etc.

Other Methods adopted by the teacher – Please write the specific teaching method

**Lesson Plan**

**MCM DAV College for Women, Sector – 36A, Chandigarh**

**Monthly Teaching Plans (Even Semester)**

**Session – (2020-21)**

**Name of the Teacher/s: Dr. Swatika Sharma**

**Department: Chemistry**

**Class: B.Sc (4th Semester) Subject: Organic Chemistry**

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| **S.No.** | **Date**  **(Monthly)** | | | **Topics to be Covered** | **Academic Activity Undertaken\*** |
| **From** | | **To** |
| 1 | 01.04.2021 | | 15.04.2021 | Structure and nomenclature of acid chlorides, esters, amides and acid anhydrides. Relative stability & reactivity of acyl derivatives. Physical properties, interconversion of acid derivatives by nucleophilic acyl substitution. Preparation of carboxylic acid derivatives, chemical reactions. Mechanisms of esterification and hydrolysis (acidic and basic). | Lecture |
| 2 | 16.04.2021 | | 30.04.2021 | Nomenclature of ether and methods of their formation, physical properties. Chemical reaction-cleavage and autoxidation, Ziesel’s method. Synthesis of epoxides. Acid and base-catalyzed ring opening of epoxides, orientation of epoxide ring opening, reactions of Grignard and organolithium reagents with epoxides. | Lecture |
| 3 | 1.05.2021 | | 15.05.2021 | Natural fats, edible and industrial oils of vegetable origin, common fatty acids, glycerides, hydrogenation of unsaturated oils. Saponification value, iodine value, acid value. Soaps, synthetic detergents; alkyl and aryl sulphonates. | Lecture and Group Discussion |
| 4 | 17.05.2021 | | 31.05.2021 | Preparation of nitroalkanes and nitroarenes. Chemical reactions of nitroalkanes. Mechanisms of nucleophilic substitution in nitroarenes and their reductions in acidic, neutral and alkaline media. Picric acid. Structure and nomenclature of amines, physical properties. Stereochemistry of amines, Separation of a mixture of primary, secondary and tertiary amines. | Lecture |
| 5 | 1.06.2021 | | 15.06.2021 | Structural features effecting basicity of amines. Amine salts as phasetransfer catalysis. Preparation of alkyl and aryl amines (reduction of nitro compounds, nitriles), reductive amination of aldehydic and ketonic compounds. Gabriel-phthalimide reaction, Hofmann bromamide reaction. | Lecture |
| 6 | 16.06.2021 | | 30.06.2021 | Introduction: Moleculer Orbital picture and aromatic character of pyrrole, furan, thiophene, pyridine. Methods of synthesis and chemical reactions with particular emphasis on the mechanism of electrophilic substitution. Mechanism of nucleophilic substitution reactions in pyridine derivatives. Comparison of basicity of pyridine, piperidine and pyrrole. Introduction to condensed-five and six-membered heterocycles. | Lecture and Group Discussion |
| 7 | 1.07.2021 | | Till exams | Preparation and reactions of indole, quinoline and isoquinoline with special reference to Fisher indole synthesis. Skraup synthesis and Bischler-Napieralski synthesis. Mechanism of electrophilic substitution reactions of indole, quinoline and isoquinoline. | Lecture |
| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans** | | | | | |
| 5thApril, 2021 | | The teachers have completed the scheduled chapters and topics as shown in the lesson plan | | | |
| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans** | | | | | |
| 3rd May, 2021 | | The teachers have completed the scheduled chapters and topics as shown in the lesson plan | | | |
| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans** | | | | | |
| 7th June, 2021 | | The teachers have completed the scheduled chapters and topics as shown in the lesson plan | | | |
| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans** | | | | | |
| 5th July  , 2021 | | The teachers have completed the scheduled chapters and topics as shown in the lesson plan | | | |

**\*Any of these** – (i) Lecture Method; (ii) PPT; (iii) Online Sources; (iv) Group Discussion; (v) Case Studies etc.

Other Methods adopted by the teacher – Please write the specific teaching method

**Lesson Plan**

**MCM DAV College for Women, Sector – 36A, Chandigarh**

**Monthly Teaching Plans (Odd Semester)**

**Session – (2020-21)**

**Name of the Teacher/s Ms. Swati Nag**

**Department: Chemistry**

**Class: B.Sc (3rd semester) Subject: Physical Chemistry Section (s): A and B**

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| **S.No.** | **Date**  **(Monthly)** | | | **Topics to be Covered** | **Academic Activity Undertaken\*** |
| **From** | | **To** |
| 1 | 13.08.2020 | | 31.08.2020 | Unit-I: Liquid State  Intermolecular forces, structure of liquids (a qualitative description). Structural differences between solids, liquids and gases. | Lecture and group discussion |
| 2 | 1.09.2020 | | 30.09.2020 | Unit-I: Liquid State  Liquid Crystals : Difference between liquid crystal, solid and liquid. Classification, structure of nematic and cholestric phases. Thermography and seven segment cell.  UNIT-II: Chemical Equilibrium  Equilibrium constant and free energy. Thermodynamic derivation of law of mass of mass action. Le - Chatelier’s principle. | Lecture and group discussion |
| 3 | 1.10.2020 | | 30.10.2020 | Unit-II  Reaction isotherm and Reaction isochore-Clapeyron equation and Clausius –Clapeyron equation, applications.  Unit-III: Thermodynamics-II  Second Law of Thermodynamics: Need for the law, different statements of the law, Carnot cycle and its efficiency, Carnot theorem. Thermodynamic scale of temperature. | Lecture  and group discussion |
| 4 | 3.11.2020 | | 28.11.2020 | Unit-III  Concept of Entropy: Entropy as a state function, entropy as a function of V & T, entropy as a function of P & T, entropy change in physical change, Clausius inequality, entropy as a criteria of spontaneity and equilibrium. Entropy change in ideal gases and mixing of gases. | Lecture and group discussion |
| 5 | 1.12.2020 | | 24.12.2020 | Unit-IV: Thermodynamics-III  Third Law of Thermodynamics: Nernst heat theorem, statement and concept of residual entropy, evaluation of absolute entropy from heat capacity data. Gibbs and Helmholtz functions; Gibbs function (G) and Helmholtz functions (A) as thermodynamic quantities, A & G as criteria for thermodynamic equilibrium and spontaneity, their advantage over entropy change. | Lecture and group discussion |
| 6 | 1.01.2021 | | Till exams | Variation of G and A with P, V and T. And Revision | Lecture and group discussion |
| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans** | | | | | | |
| 7th September, 2020 | | The teachers have completed the scheduled chapters and topics as shown in the lesson plan | | | | |
| **Departmental Meeting to Coordinate and Review the Monthly completion of**  **Syllabus as per lesson plans** | | | | | | |
| 5th October, 2020 | | The teachers have completed the scheduled chapters and topics as shown in the lesson plan | | | | |
| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans** | | | | | | |
| 3rd November,2020 | | The teachers have completed the scheduled chapters and topics as shown in the lesson plan | | | | |
| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans** | | | | | | |
| 7th December, 2020 | | The teachers have completed the scheduled chapters and topics as shown in the lesson plan | | | | |
| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans**   |  |  | | --- | --- | | 4th January, 2021 | The teachers have completed the scheduled chapters and topics as shown in the lesson plan | | | | | | | |

**\*Any of these** – (i) Lecture Method; (ii) PPT; (iii) Online Sources; (iv) Group Discussion; (v) Case Studies etc.

Other Methods adopted by the teacher – Please write the specific teaching method

**Lesson Plan**

**MCM DAV College for Women, Sector – 36A, Chandigarh**

**Monthly Teaching Plans (Even Semester)**

**Session – (2020-21)**

**Name of the Teacher/s: Ms. Swati Nag**

**Department: Chemistry**

**Class: B.Sc (4th Semester) Subject: Physical Chemistry**

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| **S.No.** | **Date**  **(Monthly)** | | **Topics to be Covered** | **Academic Activity Undertaken\*** |
| **From** | **To** |
| 1 | 01.04.2021 | 30.04.2021 | Unit-I: Phase equilibrium:  Statement and meaning of the terms – phase, component and degree of freedom, derivation of Gibbs phase rule, phase equilibria of one component system—water, CO2 and S systems. Phase equilibria of two component system –solid –liquid equilibria, simple eutectic – Bi-Cd system, desiliverisation of lead. Solid solutions—compound formation with congruent melting point (Mg-Zn) and incongruent melting point, (NaCl-H2O) system. Freezing mixtures, acetone-dry ice. | Lecture and Group Discussion |
| 2 | 1.05.2021 | 31.05.2021 | Unit-I  Partially Miscible Liquids –Phenol-water, trimethylamine – water, nicotine –water systems. Nernst distribution law-thermodynamic derivation, applications.  Unit-II: Electrochemistry –I  Electrical transport –Conduction in metals and in electrolyte solutions, specific conductance and equivalent conductance, measurement of equivalent conductance, variation of equivalent and specific conductance with dilution. Migration of ions and Kohlrausch Law, Arrhennius theory of electrolyte dissociation and its limitations, weak and strong electrolytes, Ostwald’s dilution law, its uses and limitations. Debye-Huckel-Onsager’s equation for strong electrolytes (elementary treatment only). Transport number, definition and determination by Hittorf method and moving boundary method. | Lecture and Group Discussion |
| 3 | 1.06.2021 | 15.06.2021 | Unit-III: Electrochemistry-II  Types of reversible electrodes – gas metal – ion, metal –insoluble salt – anion and redox electrodes. Electrode reactions, Nernst equation, derivation of cell E.M.F. and single electrode potential, standard hydrogen electrode – reference electrodes – standard electrode potential, sign conventions, electrochemical series and its significance. | Lecture and Group Discussion |
| 4 | 16.06.2021 | 30.06.2021 | Unit-IV:  Electrolytic and Galvanic cells – reversible and irreversible cells, conventional representation of electrochemical cells. E.M.F. of a cell and its measurements. Computation of cell E.M.F. Calculation of thermodynamic quantities of cell reactions (∆G, ∆H and K), Polarization, over potential and hydrogen overvoltage. Concentration cell with and without transport, liquid junction potential, application of concentration cells, valency of ions, solubility product and activity coefficient, potentiometric titrations. | Lecture and Group Discussion |
| 5 | 1.07.2021 | Till exams | Previous question papers and doubts sessions | Lecture and Group Discussion |

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| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans** | |
| 5th April, 2021 | The teachers have completed the scheduled chapters and topics as shown in the lesson plan |
| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans** | |
| 3rd May, 2021 | The teachers have completed the scheduled chapters and topics as shown in the lesson plan |
| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans** | |
| 7th June, 2021 | The teachers have completed the scheduled chapters and topics as shown in the lesson plan |
| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans** | |
| 5th July, 2021 | The teachers have completed the scheduled chapters and topics as shown in the lesson plan |

**\*Any of these** – (i) Lecture Method; (ii) PPT; (iii) Online Sources; (iv) Group Discussion; (v) Case Studies etc.

Other Methods adopted by the teacher – Please write the specific teaching method