**Lesson Plan**

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

**Monthly Teaching Plans (1st Semester)**

**Session –2020-21**

**Name of the Teacher: Dr. Rohini Kanwar**

**Department: Chemistry**

**Class: B.Sc (1st Semester) Subject: Inorganic Chemistry**

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| **S.No.** | **Date**  **(Monthly)** | | **Topics to be Covered** | **Academic Activity Undertaken\*** |
| **From** | **To** |
| 1. | 1-09-2020 | 15-09-2020 | **Idea of de Broglie matter waves, Heisenberg uncertainty principle, atomic orbitals** | **Lecture** |
| 2. | 16-09-2020 | 30-09-2020 | **Schrodinger wave equation, significance of Ψ and Ψ2, quantum numbers, radial and angular wave functions and probability distribution curves** | **Lecture and group discussion** |
| 3. | 1-10-2020 | 15-10-2020 | **Shapes of s, p, d orbitals, Aufbau and Pauli exclusion principle, Hund’s multiplicity rule, Electronic configuration of elements and ions** | **Lecture** |
| 4. | 16-10-2020 | 30-10-2020 | **Position of elements in the periodic table, Effective nuclear charge and its calculation, Atomic and ionic radii, ionization energy, electron affinity and electronegativity** | **Lecture and group discussion** |
| 5. | 3-11-2020 | 16-11-2020 | **Methods of determination of electronegativity, trends in periodic table and application in predicting and explaining the chemical behavior** | **Lecture** |
| 6. | 17-11-2020 | 28-11-2020 | **Chemical properties of the noble gases, chemistry of xenon, structure and bonding in xenon compounds, Comparative study, diagonal relationships, salient features of hydrides** | **Lecture** |
| 7. | 1-12-2020 | 15-12-2020 | **Solvation and complexation tendencies including their functions in biosystems, introduction to alkyls and aryls. Covalent Bond- Valence bond theory and its limitations** | **Lecture** |
| 8. | 16-12-2020 | 24-12-2020 | **Directional characteristics of covalent bond, various types of hybridizations and shapes of simple inorganic molecules and ions. BeF2, BF3, CH4, PF5, SF6, IF7, SnCl2, XeF4, BF4-, PF6-, SnCl62-** | **Lecture, Group discussion and Seminar** |
| 9. | 1-01-2021 | 15-01-2021 | **VSEPR Theory to NH3, H3O+, SF4, ClF3, ICl2- and H2O, MO theory, homonuclear elements and ions and heteronuclear (BO, CN, CO+, NO+, CO, CN-), diatomic molecules** | **Lecture, Group discussion and Seminar** |
| 10. | 16-01-2021 | Till exam date | **Percentage ionic character from dipole moment and electronegativity difference** | **Lecture** |
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| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans** | |
| 5th Oct, 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 Nov, 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 Dec, 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 Jan, 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 (2nd Semester)**

**Session –2020-2021**

**Name of the Teacher: Dr. Rohini Kanwar**

**Department: Chemistry**

**Class: B.Sc (2nd 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 | **Ionic Solids – Concept of close packing, Ionic structures, (NaCl type, Zinc blende, Wurtzite, CaF2 and antifluorite)** | **Lecture, PPT, videos explaining the close packing and structure** |
| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans 5th April, 2021** | | | | |
| 2. | 16-04-2021 | 30-04-2021 | **Radius ratio rule and coordination number, limitation of radius ratio rule, lattice defects, semiconductors, Lattice energy and Born-Haber cycle, solvation energy and solubility of ionic solids** | **Lecture, PPT** |
| 3. | 1 -05-2021 | 15-05-2021 | **Polarizing power and polarisability of ions, Fajan’s rule. Metallic bond-free electron, valence bond and band theories. Weak Interactions – Hydrogen bonding, Vander Waals forces.** | **Lecture** |
| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 3rd May, 2021** | | | | |
| 4. | 17 -05-2021 | 31-05-2021 | **Comparative study (including diagonal relationship) of groups 13-14 elements, compounds like hydrides, oxides, oxyacids and halides of groups 13-14, hydrides of boron-diborane** | **Lecture** |
| 5. | 1-06-2021 | 15-06-2021 | **Higher boranes, borazine, borohydrides, fullerenes, carbides, fluorocarbons.** | **Lecture and group discussion** |
| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 7th June, 2021** | | | | |
| 6. | 16-06-2021 | 30-06-2021 | **Comparative study of groups 15-17 elements,Compounds like hydrides, oxides** | **Lecture** |
| 7. | 1-07-2021 | Till exams | **oxyacids and halides of groups 15-17, silicates (structural principle), tetrasulphur tetranitride. Basic properties of halogens, interhalogens and polyhalides** | **Lecture** |
| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 5th July, 2021** | | | | |

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

**Sample Format (Lesson Plan)**

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

**Monthly Teaching Plans (Odd Semester/Even Semester)**

**Session – (2020-21\_\_\_\_\_\_)**

**Name of the Teacher/s\_\_\_\_\_\_\_\_\_Ms. Sonia Devi\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Department \_\_\_\_\_\_\_\_\_\_\_\_\_Chemistry \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Class \_\_\_\_\_\_\_BSc 1\_(semester-1)\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_ Subject \_\_\_\_\_\_\_\_\_\_\_Organic Chemistry\_\_\_\_\_\_\_Section (s)\_\_\_\_\_\_\_\_\_\_\_**

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| **S.No.** | **Date**  **(Monthly)** | | **Topics to be Covered** | **Academic Activity Undertaken\*** |
| **From** | **To** |
| 1 | 1st September | 30th September | Structure and bonding | Lecture |
| 2 | 1st October | 30th October | Mechanism of organic reactions | Lecture |
| 3 | 3rd November | 28th November | Electro-magnetic spectrum; absorption spectrum | Lecture |
| 4 | 1st  December | 24th December | Stereo-chemistry of organic compounds 1 | Lecture |
| 5 | 1st January | Till exams | Stereo-chemistry of organic compounds 2 | Lecture |
| **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: Ms. Sonia Devi**

**Department: P.G. Department of Chemistry**

**Class: B.Sc I Subject: Organic Chemistry**

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| **S.No.** | **Date**  **(Monthly)** | | **Topics to be Covered** | **Academic Activity Undertaken\*** |
| **From** | **To** |
| 1 | 1-04-2021 | 30-04-2021 | **Unit I Alkenes and Cycloalkenes:** Nomenclature of alkenes, methods of formation, mechanisms of dehydration of alcohols and dehydrohalogenation of alkyl halides,  regioselectivity in alcohol dehydration. The Saytzeff rule, Hofmann elimination, physical properties and relative stabilities of alkenes. Chemical reactions of alkenes – mechanisms involved in hydrogenation, electrophilic and free radical additions, Markownikiff’s rule, hydroboration-oxidation, oxymercuration-reduction. Epoxidation, ozonolysis, hydration, hydroxylation and oxidation with KMnO4 | Lecture method |
| 2 | 01-05-2021 | 31-05-2021 | **Unit I Alkenes and Cycloalkenes:** Polymerization of alkenes. Substitution at the allylic and vinylic positions of alkenes. Industrial applications of ethylene and propene.  **Unit II Dienes and Alkynes:**  Methods of formation, conformation and Chemical reactions of cycloalkenes. Nomenclature and classification of dienes : isolated, conjugated and cumulated dienes. Structure of  allenes and butadiene, methods of formation, polymerization. Chemical reactions – 1, 2 and 1,4 addition, Diels-Alder reaction.  Nomenclature, structure and bonding in alkynes. Methods of formation. Chemical reactions of alkynes, acidity of alkynes. Mechanism of electrophilic and nucleophilic addition reactions, hydroboration-oxidation, metal-ammonia reductions, oxidation and polymerization. | Lecture method |
| 3 | 01-06-2021 | 30-06-2021 | **Unit III Arenes and Aromaticity:**  Nomenclature of benzene derivatives. The aryl group. Aromatic nucleus and side chain. Structure of benzene : molecular formula and Kekule structure. Stability and carbon-carbon bond lengths of benzene,  resonance structure, MO picture. Aromaticity: The Huckel Rule, aromatic ions. Aromatic electrophilic substitution – general pattern of the mechanism, role of σ-and π complexes. Mechanism of nitration, halogenation, sulphonation, mercuration and Friedel-Crafts reaction. Energy profile diagrams. Activating and deactivating substituents, orientation and ortho/para ratio. Side chain reactions of benzene derivatives. Birch reduction. Methods of formation and chemical reactions of alkyl benzenes, alkynyl benzenes and biphenyl. | Lecture method |
| 4 | 01-07-2021 | Till exams | **Unit IV Alkyl and Aryl Halides:** Nomenclature and classes of alkyl halides, methods of formation, chemical reactions. Mechanisms of  nucleophilic substitution reactions of alkyl halides, SN2and SN1 reactions with energy profile diagrams.  Polyhalogen compounds: chloroform, carbon tetrachloride. Methods of formation of aryl halides, nuclear and side chain reactions. The addition-elimination and the  elimination-addition mechanisms of nucleophilic aromatic substitution reactions.  Relative reactivities of alkyl halides vs. allyl, vinyl and aryl halides. | Lecture method |
| **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

**Sample Format (Lesson Plan)**

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

**Monthly Teaching Plans (Odd Semester)**

**Session – (2020-21)**

**Name of the Teacher/s: 1. Dr. Yesbinder**

**Department \_\_Chemistry\_\_**

**Class\_B.Sc. I\_ 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 | 1st September, 2020 | 30th September, 2020 | **Unit 1: Mathematical Concepts and Evaluation of Analytical Data:**    **Logarithmic relations, curve sketching, linear graphs and calculation of slopes, differentiation and integration of functions like ex, xn, sin x, log x; maxima and minima, partial differentiation and reciprocity relations. Terms of mean and median, precision and accuracy in chemical analysis, determining accuracy of methods, improving accuracy of analysis, data treatment for series involving relatively few measurements, linear least squares curve fitting, types of errors, standard deviation.** | **Lecture method, Online sources** |
| 2 | 1st October, 2020 | 30th October, 2020 | **Unit-II:Gaseous States:**  **Postulates of kinetic theory of gases, deviation from ideal behavior, Van der Waal’s equation of state.**  **Critical Phenomena: PV isotherms of real gases, continuity of states, the isotherms of Van der Waal’s equation, relationship between critical constants and Van der Waal’s constants, the law of corresponding states, reduced equation of state. Molecular Velocities: Root mean square, average and most probable velocities. Qualitative discussion of the Maxwell’s distribution of molecular velocities, collision number, mean free path and collision diameter. Liquification of gases (based on Joule-Thomson effect).** | **Lecture method** |
| 3 | 3rd November, 2020 | 28th November, 2020 | **Unit-III: Chemical Kinetics-1**  **Chemical kinetics and its scope, rate of a reaction, factors influencing the rate of a reaction- concentration, temperature, pressure, solvent, light, catalyst. Concentration dependence of rates, mathematical characteristics of simple chemical reactions – zero order, first order, second order, pseudo order, half life and mean life.** | **Lecture Method, Online Sources** |
| 4 | 1st December, 2020 | 24th December , 2020 | **Determination of the order of reaction – differential method, method of integration, method of half life period and isolation method.**  **Unit-IV: Chemical Kinetics-II**  **Theories of Chemical Kinetics: Effect of temperature on rate of reaction, Arrhenius equation, concept of activation energy.** | **Lecture Method** |
| 5. | 1st January 2021 | Till exam date | **Simple collision theory based on hard sphere model, transition state theory (equilibrium hypothesis). Expression for the rate constant based on equilibrium constant and thermodynamic aspects.**    **Catalysis and general characteristics of catalytic reactions, Homogeneous catalysis, acid-base catalysis and enzyme catalysis including their mechanisms, Michaelis Menten equation for enzyme catalysis and its mechanism.** |  |
| **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 | | | |
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| 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 | | | |
| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans** | | | | |

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

**Sample Format (Lesson Plan)**

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

**Monthly Teaching Plans (Even Semester)**

**Session – (2020-21)**

**Name of the Teacher/s: 1. Dr. Dipika Narula**

**Department \_\_Chemistry\_\_**

**Class\_B.Sc. I\_ 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 | 1st April, 2021 | 30th April, 2021 | **Unit 1: Thermodynamics I**  **Definition of Thermodynamic Terms: System, surroundings etc. Types of systems, intensive and extensive properties. State and path functions and their differentials. Thermodynamic process. Concept of heat and work.**  **First Law of Thermodynamics: Statement, definition of internal energy and enthalpy, Heat capacity, heat capacities at constant volume and pressure and their relationship. Joule’s Law-Joule-Thomson coefficient and inversion temperature. Calculations of w, q, dU & dH for the expansion of ideal gases under isothermal and adiabatic conditions for reversible process.** | **Lecture method, Online sources** |
| 2 | 1st May, 2021 | 31st May, 2021 | **Unit-II: Thermochemistry**  **Standard state, standard enthalpy of formation-Hess’s Law of constant Heat Summation and its applications. Heat of reaction at constant pressure and at constant volume. Enthalpy of neutralization. Bond dissociation energy and its calculation from thermo-chemical data, temperature dependence of enthalpy. Kirchoff’s equation.** | **Lecture method** |
| 3 | 1st June, 2021 | 30th June, 2021 | **Unit-III: Colloidal State**  **Definition of colloids, classification of colloids. Solids in liquids (sols): Properties –kinetic, optical and electrical; stability of colloids, protective action, Hardy-Schulze rules, gold number.**  **Liquids in liquids (emulsions) : Types of emulsions, preparation.**  **Emulsifier. Liquids in solids (gels): Classification, preparation and properties, inhibition, general applications of colloids.** | **Lecture Method, Online Sources** |
| 4 | 1st July, 2021 | Till exams | **Unit-IV: Solutions, Dilute Solutions and Colligative Properties:**  **Ideal and non-ideal solutions, methods of expressing concentrations of solutions, activity and activity coefficient.**  **Dilute solution, colligative properties, Raoult’s law, relative lowering of vapour pressure, molecular weight determination. Osmosis, law of osmotic pressure and its measurement, determination of molecular weight from osmotic pressure. Elevation of boiling point and depression of freezing point, Thermodynamic derivation of relation between molecular weight and elevation in boiling point and depression of freezing point. Experimental methods for determining various colligative properties.** | **Lecture Method** |
| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans** | | | | |
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| **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 | | | |
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**\*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

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