Lesson Plan

Mehr Chand Mahajan DAV College for Women, Sector – 36A, Chandigarh
Monthly Teaching Plans (1st Semester)
Session –2019-2020

Name of the Teacher: Dr. Archana

Department: Chemistry

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

S.No.	Date (Monthly)		Topics to be Covered	Academic Activity Undertaken*
	From	To		
1.	24-07-2019	31-07-2019	**Idea of de Broglie matter waves, Heisenberg uncertainty principle, atomic orbitals**	**Lecture**
2.	01-08-2019	14-08-2019	**Schrodinger wave equation, significance of Ψ and Ψ^2, quantum numbers, radial and angular wave functions and probability distribution curves**	**Lecture and group discussion**
3.	16-08-2019	31-08-2019	**Shapes of s, p, d orbitals, Aufbau and Pauli exclusion principle, Hund's multiplicity rule, Electronic configuration of elements and ions**	**Lecture**
4.	02-09-2019	14-09-2019	**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.	16-09-2019	30-09-2019	**Methods of**	**Lecture**

			determination of electronegativity, trends in periodic table and application in predicting and explaining the chemical behavior	
6.	01-10-2019	14-10-2019	**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.	16-10-2019	31-10-2019	**Solvation and complexation tendencies including their functions in biosystems, introduction to alkyls and aryls. Covalent Bond- Valence bond theory and its limitations**	**Lecture**
8.	01-11-2019	15-11-2019	**Directional characteristics of covalent bond, various types of hybridizations and shapes of simple inorganic molecules and ions. BeF_2, BF_3, CH_4, PF_5, SF_6, IF_7, $SnCl_2$, XeF_4, BF_4^-, PF_6^-, $SnCl_6^{2-}$**	**Lecture, Group discussion and Seminar**
9.	16-11-2019	30-11-2019	**VSEPR Theory to NH_3, H_3O^+, SF_4, ClF_3, ICl_2^- and H_2O, MO theory, homonuclear elements and ions and heteronuclear (BO, CN, CO^+, NO^+, CO, CN^-), diatomic molecules**	**Lecture, Group discussion and Seminar**
10.	02-12-2019	06-12-2019	**Percentage ionic character from dipole moment and electronegativity difference**	**Lecture**

***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

Mehr Chand Mahajan DAV College for Women, Sector – 36A, Chandigarh
Monthly Teaching Plans (2nd Semester)
Session –2019-2020

Name of the Teacher: Dr. Archana

Department: Chemistry

Class: B.Sc (2nd Semester) **Subject: Inorganic Chemistry**

S.No.	Date (Monthly)		Topics to be Covered	Academic Activity Undertaken*
	From	To		
1.	09-01-2020	31-01-2020	**Ionic Solids – Concept of close packing, Ionic structures, (NaCl type, Zinc blende, Wurtzite, CaF_2 and antifluorite)**	**Lecture, PPT, videos explaining the close packing and structure**
2.	01-02-2020	15-02-2020	**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.	17-02-2020	29-02-2020	**Polarizing power and polarisability of ions, Fajan's rule. Metallic bond-free electron, valence bond and band theories. Weak Interactions – Hydrogen bonding, Vander Waals**	**Lecture**

			forces.	
4.	02-03-2020	14-03-2020	**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.	16-03-2020	31-03-2020	**Higher boranes, borazine, borohydrides, fullerenes, carbides, fluorocarbons.**	**Lecture and group discussion**
6.	01-04-2020	15-04-2020	**Comparative study of groups 15-17 elements,Compounds like hydrides, oxides**	**Lecture**
7.	16-04-2020	30-04-2020	**oxyacids and halides of groups 15-17, silicates (structural principle), tetrasulphur tetranitride**	**Lecture**
8.	01-05-2020	04-05-2020	**Basic properties of halogens, interhalogens and polyhalides.**	**Lecture**

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

Sample Format (Lesson Plan)

Mehr Chand Mahajan DAV College for Women, Sector – 36A, Chandigarh
Monthly Teaching Plans (1st Semester)
Session – (2019-20)

Name of the Teacher/s: Dr. Swatika Sharma

Department : Chemistry

Class : BSc 1(semester-1) **Subject: Organic Chemistry**

S.No.	Date (Monthly)		Topics to be Covered	Academic Activity Undertaken*
	From	To		
1	24th july	31st july	Structure and bonding	Lecture
2	31st july	14th august	Mechanism of organic reactions	Lecture
3	16th august	16th september	Electro-magnetic spectrum; absorption spectrum	Lecture
4	17th september	20th october	Stereo-chemistry of organic compounds 1	Lecture
5	21st october	25th november	Stereo-chemistry of organic compounds 2	Lecture

Lesson Plan

Mehr Chand Mahajan DAV College for Women, Sector – 36A, Chandigarh
Monthly Teaching Plans (2nd Semester)
Session – 2019-20

Name of the Teacher: Dr. Swatika Sharma

Department: P.G. Department of Chemistry

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

S.No.	Date (Monthly)		Topics to be Covered	Academic Activity Undertaken*
	From	To		
1	9.01.20	31.01.20	**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 $KMnO_4$	Lecture method
2	01.02.20	29.02.20	**Unit I Alkenes and Cycloalkenes:**	Lecture method

			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.	
3	02.03.20	31.03.20	**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,	Lecture method

			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.	
4	01.04.20	30.04.20	**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, SN^2 and SN^1 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

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

Sample Format (Lesson Plan)

Mehr Chand Mahajan DAV College for Women, Sector – 36A, Chandigarh
Monthly Teaching Plans (1st Semester)
Session – (2019-20)

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

Department : Chemistry

Class: B.Sc. I **Subject : Physical Chemistry**
Section (s) A and B

S.No.	Date (Monthly)		Topics to be Covered	Academic Activity Undertaken*
	From	To		
1	24th July, 2019	31st July, 2019	**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**	**Lecture method, Online sources**

			fitting, types of errors, standard deviation.	
2	1st August, 2019	31st August, 2019	**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	2nd September, 2019	30th September, 2019	**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,**	**Lecture Method, Online Sources**

			mathematical characteristics of simple chemical reactions – zero order, first order, second order, pseudo order, half life and mean life.	
4	1st October, 2019	19th October , 2019	**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.	21st October, 2019	30th November, 2019	**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.**	

***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)

Mehr Chand Mahajan DAV College for Women, Sector – 36A, Chandigarh
Monthly Teaching Plans (2nd Semester)
Session – (2019-20)

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

Department : Chemistry

Class:_B.Sc. I **Subject Physical Chemistry**
Section (s) A and B

S.No.	Date (Monthly)		Topics to be Covered	Academic Activity Undertaken*
	From	To		
1	9th January, 2020	31st January, 2020	**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**	**Lecture method, Online sources**

			temperature. Calculations of w, q, dU & dH for the expansion of ideal gases under isothermal and adiabatic conditions for reversible process.	
2	1st February, 2020	29th February, 2020	**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	2nd March, 2020	31st March, 2020	**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**	**Lecture Method, Online Sources**

			colloids.	
4	1st April, 2020	15th April , 2020	**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**

***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