

Lesson Plan

Mehr Chand Mahajan DAV College for Women, Sector – 36A, Chandigarh
Monthly Teaching Plans (3rd Semester)
Session – (2019-20)

Name of the Teacher/s: Dr. Dhanya James

Department: Chemistry

Class: B.Sc (3rd semester)

Subject: Inorganic Chemistry

S.No.	Date (Monthly)		Topics to be Covered	Academic Activity Undertaken*
	From	To		
1	24.07.2019	14.08.2019	Characteristic Properties of d-block elements	Lecture
2	16.08.2019	31.08.2019	Properties of the elements of first transition series, Simple compounds and Complexes	Lecture
3	2.09.2019	16.09.2019	Illustrating relative stability of Oxidation States, Coordination number and geometry	Lecture
4	17.09.2019	30.09.2019	General characteristic and comparative treatment with 3d-analogues	Lecture and group discussion
5	1.10.2019	16.10.2019	Werners theory and its experimental validation, Effective atomic number concept and Chelates	Lecture
6	17.10.2019	31.10.2019	Nomenclature and isomerism of Coordination compounds	Group discussion
7	1.11.2019	15.11.2019	Valence bond theory of coordination metal complexes and their properties	Lecture
8	16.11.2019	29.11.2019	Uses of coordination compounds	Lecture and Group discussion

*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 **Lesson Plan**

Lesson Plan

**Mehr Chand Mahajan DAV College for Women, Sector – 36A,
Chandigarh
Monthly Teaching Plans (4th Semester)
Session – (2019-20)**

Name of the Teacher/s: Dr. Dhanya James
Department: Chemistry

Class: B.Sc (4th Semester)

Subject: Inorganic Chemistry

S.No.	Date (Monthly)		Topics to be Covered	Academic Activity Undertaken*
	From	To		
1	09.01.2020	31.01.2020	Electronic structure, oxidation states, ionic radii and lanthanide contraction.	Lecture
2	1.02.2020	15.02.2020	Complex formation, occurrence and isolation of lanthanides. General chemistry of actinides.	Lecture
3	17.02.2020	29.02.2020	Chemistry of separation of Np,Pu and Am from U. Similarity between the later actinides and the later lanthanides.	Lecture and Group Discussion
4	2.03.2020	14.03.2020	Arrhenius, Bronsted-Lowry, lux-Flood and solvent system concept.	Lecture
5	16.03.2020	31.03.2020	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	1.04.2020	15.04.2020	Principle involved in extraction of elements. Properties and type of solvent, general characteristics of solvent.	Lecture and Group Discussion
7	16.04.2020	20.04.2020	Reactions in non aqueous solvent (liquid ammonia and liquid SO ₂)	Lecture

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Mehr Chand Mahajan DAV College for Women, Sector – 36A, Chandigarh
Monthly Teaching Plans (3rd Semester)
Session – (2019-20)

Name of the Teacher/s: Dr. Swatika Sharma

Department: Chemistry

Class: B.Sc (3rd semester)

Subject: Organic Chemistry

S.No.	Date (Monthly)		Topics to be Covered	Academic Activity Undertaken*
	From	To		
1	24.07.2019	14.08.2019	Classification and nomenclature Monohydric alcohols-Nomenclature, methods of formation by reduction of aldehydes, ketones, carboxylic acids and esters. Hydrogen bonding. Acidic nature.	Lecture
2	16.08.2019	31.08.2019	Reactions of alcohols. Dihydric and Trihydric alcohols Nomenclature, methods of formation, chemical reactions of vicinal glycols and glycerol. Preparation of phenols, physical properties and acidic character.	Lecture
3	2.09.2019	16.09.2019	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	17.09.2019	30.09.2019	Nomenclature and structure of the carbonyl group. Synthesis of aldehydes and ketones with particular reference to the synthesis of	Lecture and group discussion

			aldehydes from acid chlorides, synthesis of aldehydes and ketones using 1,3-dithianes, synthesis of ketones from nitriles and from carboxylic acids. Physical properties.	
5	1.10.2019	16.10.2019	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	17.10.2019	31.10.2019	Oxidation of aldehydes, Baeyer-Villiger oxidation of ketones, Cannizzaro reaction, MPV, Clemmensen, Wolff-Kishner, LiAlH ₄ and NaBH ₄ 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	1.11.2019	15.11.2019	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	16.11.2019	30.11.2019	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	2.12.2019	7.12.2019	Revision and question answer discussion	Group discussion

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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 (4th Semester)
Session – (2019-20)

Name of the Teacher/s: Dr. Swatika Sharma

Department: Chemistry

Class: B.Sc (4th Semester)

Subject: Organic Chemistry

S.No.	Date (Monthly)		Topics to be Covered	Academic Activity Undertaken*
	From	To		
1	09.01.2020	31.01.2020	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	1.02.2020	15.02.2020	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	17.02.2020	29.02.2020	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	2.03.2020	14.03.2020	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	16.03.2020	31.03.2020	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	1.04.2020	15.04.2020	Introduction: Molecular 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	16.04.2020	30.04.2020	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

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Lesson Plan

Mehr Chand Mahajan DAV College for Women, Sector – 36A, Chandigarh
Monthly Teaching Plans (3rd Semester)
Session – (2019-20)

Name of the Teacher/s : Dr.Ankita

Department: Chemistry

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

S.No.	Date (Monthly)		Topics to be Covered	Academic Activity Undertaken*
	From	To		
1	24.07.2019	31.07.2019	Unit-I: Liquid State Intermolecular forces, structure of liquids (a qualitative description). Structural differences between solids, liquids and gases.	Lecture and group discussion
2	1.08.2019	31.08.2019	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	2.09.2019	30.09.2019	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	1.10.2019	31.10.2019	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	1.11.2019	30.11.2019	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. Variation of G and A with P, V and T.	Lecture and group discussion

***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 (4th Semester)
Session – (2019-20)

Name of the Teacher/s: Dr. Ankita

Department: Chemistry

Class: B.Sc (4th Semester)

Subject: Physical Chemistry

S.No.	Date (Monthly)		Topics to be Covered	Academic Activity Undertaken*
	From	To		
1	09.01.2020	31.01.2020	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, CO ₂ and S systems. Phase equilibria of two component system – solid –liquid equilibria, simple eutectic – Bi-Cd system, desilverisation of lead. Solid solutions—compound formation with congruent melting point (Mg-Zn) and incongruent melting point, (NaCl-H ₂ O) system. Freezing mixtures, acetone-dry ice.	Lecture and Group Discussion
2	1.02.2020	29.02.2020	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, Arrhenius theory of electrolyte dissociation and its limitations, weak and strong electrolytes, Ostwald's dilution law, its uses and	Lecture and Group Discussion

			limitations. Debye-Huckel-Onsager's equation for strong electrolytes (elementary treatment only). Transport number, definition and determination by Hittorf method and moving boundary method.	
3	2.03.2020	31.03.2020	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	1.04.2020	15.04.2020	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 (ΔG , ΔH 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	16.04.2020	20.04.2020	Previous question papers and doubts sessions	Lecture and Group Discussion

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