

Government College for Women, Bahadurgarh

Lesson plan, even semester Session

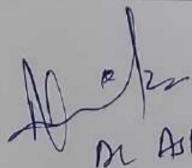
Department of Chemistry

Name of Assistant Professor: Dr. Ashima

B.Sc.2<sup>nd</sup> semester

Subject: Organic Chemistry

Date		Topics/Chapters to be covered
From	To	
21/03/2022	26/03/2022	<b>Alkene</b> – Introduction, Structure of Alkenes, Nomenclature, Isomerism, Relative stability of alkene General methods of Preparation with mechanism – Dehydrohalogenation of alkyl halide, dehydration of alcohols
28/03/2022	02/04/2022	Chemical properties of alkenes – mechanism involved in hydrogenation, electrophilic, Free Radical addition, Markovnikoff's rule
04/04/2022	09/04/2022	Chemical properties of alkenes – addition of water, addition of halogen, formation of halohydrin, hydroboration oxidation of alkene
11/04/2022	16/04/2022	Chemical properties of alkenes- oxymercuration-demercuration of alkenes. Ozonolysis, oxidation with $\text{KMnO}_4$ .
18/04/2022	23/04/2022	<b>Arenes &amp; Aromaticity</b> - introduction, structure, nomenclature of benzene derivatives.
25/04/2022	30/04/2022	Aromaticity: Huckels rule, aromatic ions, annulenes upto 10 carbon atoms.
02/05/2022	07/05/2022	Aromatic, Antiaromatic and Non Aromatic compounds. Aromatic electrophilic substitution and its mechanism.
09/05/2022	14/05/2022	Mechanism of Nitration, Halogenation, sulphonation, Friedel craft alkylation and acylation.
16/05/2022	21/05/2022	Energy profile diagrams. Activating, deactivating substituents and orientations.
23/05/2022	28/05/2022	<b>Test of Arenes and Aromaticity</b> Nomenclature of dienes, Structure of Butadienes, 1,2 and 1,4 additions, Diels alder reaction.
30/05/2022	04/06/2022	Methods of formation of alkynes, chemical properties of alkynes, Mechanism of electrophilic and nucleophilic addition reactions.
06/06/2022	11/06/2022	Hydroboration and oxidation of alkynes. <b>Alkyl and Aryl Halides</b> : General methods of preparation of alkyl and aryl halides.
13/06/2022	18/06/2022	Physical and chemical properties. Stereochemistry of $\text{SN}_1$ and $\text{SN}_2$ reactions.
20/06/2022	25/06/2022	Addition elimination and elimination addition of nucleophilic aromatic substitution reaction.
27/06/2022	30/06/2022	<b>Seminar and Test of Alkyl and Aryl halides.</b>

  
Dr. Ashima

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Lesson plan, even semester Session

Department of Chemistry

Name of Assistant Professor: Dr. Ashima

B.Sc.2nd semester

Subject: Inorganic Chemistry

Date		Topics/Chapters to be covered
From	To	
21/03/2022	26/03/2022	<b>Hydrogen Bonding &amp; Vander waal's forces:</b> Hydrogen Bonding – Definition, Types, Effect of Hydrogen Bonding on Properties of substance.
28/03/2022	02/04/2022	Hydrogen Bonding in water and ice, various types of vanderwaal's forces. <b>Test and assignments of Hydrogen Bonding and Various types of Vander wall forces.</b>
04/04/2022	09/04/2022	<b>Metallic Bond and Semiconductor</b> Brief introduction to metallic bond, band theory of metallic bond Semiconductor - Introduction, types and applications ( <b>Oral tests</b> )
11/04/2022	16/04/2022	<b>S Block Elements</b> Comparative study of general characteristics of group 1 elements – Electronic configuration, physical properties, chemical properties.
18/04/2022	23/04/2022	Comparative study of general characteristics of group 2 elements –chemical properties.
25/04/2022	30/04/2022	Anomalous behavior of lithium and Diagonal relationship. <b>Nobel gases - Chemical properties of Noble gases.</b>
02/05/2022	07/05/2022	Chemistry of Xenon, structure and bonding of flourides, oxides and oxyflourides of Xenon.
09/05/2022	14/05/2022	<b>Test and assignments of Nobel gases.</b> <b>P Block elements - Detail study of Boron family: Diborane, Borazine, Trihalides of boron.</b>
16/05/2022	21/05/2022	Detail study of Carbon family: Catenation, Carbides, Silicates, Silicons.
23/05/2022	28/05/2022	Detail study of Nitrogen family: Oxides, structure and relative acid strength of oxyacids of nitrogen and phosphorus.
30/05/2022	04/06/2022	Detail study of Oxygen family.
06/06/2022	11/06/2022	<b>Group Discussion on carbon, oxygen, Nitrogen Family.</b>
13/06/2022	18/06/2022	Detail study of Halogen family.
20/06/2022	25/06/2022	Assignment work & Viva-Voce based on Assignment.
27/06/2022	30/06/2022	<b>Seminars conducted on S block and P block elements.</b>

Dr. ASHIMA

Government College for Women, Bahadurgarh

Lesson plan, even semester Session

Department of Chemistry

Name of Assistant Professor: Dr. Ashima

B.Sc. 2nd semester, Subject: Physical Chemistry

Date		Topics/ Chapters to be covered
From	To	
21/03/2022	26/03/2022	<b>Chemical kinetics</b> Rate of reaction, rate equation, factors influencing rate of reaction concentration, temperature, pressure, solvent, light and catalyst
28/03/2022	02/04/2022	Order of reaction and integrated rate expression for zero, first, second and third order reaction
04/04/2022	09/04/2022	Half life period of a reaction, methods of determination of order of reaction
11/04/2022	16/04/2022	Effect of temperature on rate of reaction-Arrhenius equation, theories of reaction rate-simple collision theory for unimolecular and bimolecular reaction.
18/04/2022	23/04/2022	Transition state theory of bimolecular reaction. <b>Problems based on kinetics</b>
25/04/2022	30/04/2022	<b>Electrochemistry</b> Electrolytic conductance, factors affecting electrolytic conductance.
02/05/2022	07/05/2022	Specific conductance, molar conductance, equivalent conductance and relation among them and their variation with concentration.
09/05/2022	14/05/2022	Arrhenius theory of ionization, Ostwald's dilution law.
16/05/2022	21/05/2022	DHO equation for strong electrolytes, transport number, definition and determination by Hittorf's method.
23/05/2022	28/05/2022	<b>Test of chapter 1 and 2</b> Kohlrausch's law and its application.
30/05/2022	04/06/2022	Calculation of molar ionic conductance and effect of temperature and viscosity on it.
06/06/2022	11/06/2022	Application of Kohlrausch's law in calculation of conductance of weak electrolytes at infinite dilution.
13/06/2022	18/06/2022	Applications of conductivity measurements: degree of dissociation, $K_a$ of acids, solubility product, conductometric titrations
20/06/2022	25/06/2022	Definition of pH and pKa, buffer solution, buffer action, Henderson-Hasselbalch equation, mechanism of buffer action
27/06/2022	30/06/2022	<b>Revision and Seminars conducted of Electrochemistry and Chemical kinetics</b>

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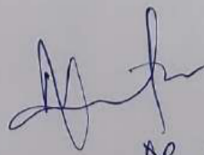
Department of Chemistry

Name of Assistant Professor: Dr. Ashima

B.Sc. 4th semester

Subject: Organic Chemistry

Date		Topics/ Chapters to be covered
From	To	
21/03/2022	26/03/2022	UNIT 1(IR Spectroscopy) Introduction of Infrared (IR) Absorption Spectroscopy, Hooke's law, Selection rules, Intensity & Position of IR bands.
28/03/2022	02/04/2022	Measurement of IR spectrum, Fingerprint Region & Characteristics absorption of various functional groups, Interpretation Of IR Spectra of Simple organic compounds & Application Of IR Spectroscopy.
04/04/2022	09/04/2022	UNIT-2(Amines) Structure and nomenclature of amines & their physical properties, Separation of amines & structural features affecting basicity of amines. Reductive Amination of Aldehydic and Ketonic compounds. Gabriel-phthalimide reaction.
11/04/2022	16/04/2022	Electrophilic aromatic substitution in aryl amines, Hofmann Boromide reaction, Reaction of amines with nitrous acid, Electrophilic aromatic substitution in aryl amines, Reaction of amines with nitrous acid.
18/04/2022	23/04/2022	Unit-3(Diazonium salts) Introduction & Mechanism of diazotization, Study of structure of benzene diazonium chloride, Replacement reactions in diazo groups and reduction of diazonium salts, Coupling reactions and its synthetic application.
25/04/2022	30/04/2022	Unit-4(Nitro compounds) Preparation and chemical properties of nitro compounds, Mechanism of electrophilic substitution reactions in nitro arenes and their reductions in acidic, neutral and alkaline medium.
02/05/2022	07/05/2022	Unit -5(Aldehydes and ketones) Nomenclature and structure of carbonyl groups, Synthesis of aldehydes and ketones.
09/05/2022	14/05/2022	Physical and chemical properties of aldehydes and ketones.
16/05/2022	21/05/2022	Comparisons of reactivities of aldehydes and ketones, Mechanism of nucleophilic addition to carbonyl group.
23/05/2022	28/05/2022	Benzoin condensation reaction with mechanism, Aldol condensation reaction with mechanism Perkin Reaction, Knoevenagel condensations.
30/05/2022	04/06/2022	Wittig reaction with mechanism, Mannich reaction with mechanism, Oxidation of aldehydes.
06/06/2022	11/06/2022	Baeyer- Villiger oxidation of ketones and Canizzaro reaction, MPV reaction.

  
DR. ASHIMA

Government College for Women, Bahadurgarh  
 Lesson plan, Even semester Session  
 Department of Chemistry  
 Name of Assistant Professor: Dr. Ashima  
 B.Sc. 4th semester  
 Subject: Inorganic Chemistry

Date		Topics/ Chapters to be covered
From	To	
21/03/2022	26/03/2022	<b>LANTHANIDES</b> Lanthanide contraction, similarity among lanthanides and reactivity of lanthanides, complex formation. Occurrence of lanthanides
28/03/2022	02/04/2022	Isolation of Lanthanides and Extraction of lanthanide elements Lanthanide compounds- oxides and chalcogenides, nitrides and uses of lanthanides.
04/04/2022	09/04/2022	<b>ACTINIDES</b> Introduction of actinides and electronic configuration of actinides Physical properties of actinides- Ionic radii and actinide contraction and colour property
11/04/2022	16/04/2022	<b>Oral Test and problem taking of lanthanides.</b> Complex formation, compounds of actinides- oxides, dioxides, pentaoxides.
18/04/2022	23/04/2022	Compounds of actinides- Halides, chalcogenides and occurrence of actinides, Extraction of uranium from pitch blende.
25/04/2022	30/04/2022	Chemistry of separation of Np, Pu, and Am from uranium Compounds of actinides- Halides, chalcogenes and occurrence of actinides, Comparison of lanthanides and actinides and Comparison of d-block with f-block elements.
02/05/2022	07/05/2022	<b>Group Discussion</b> of actinides. <b>TEST</b> of Chemistry of F-block elements. <b>THEORY OF QUALITATIVE AND QUANTITATIVE INORGANIC ANALYSIS</b> Introduction and basic principles of inorganic analysis, Interfering radicals and their removal, Interference of $\text{PO}_4^{3-}$ , Oxalates, Tartrates and their removal.
09/05/2022	14/05/2022	Systematic analysis of Cations (Basic Radicals), Chemistry of different reactions of Group 2, 2B And Group 3, Detection of Group 5 and 6 and their separation.
16/05/2022	21/05/2022	<b>Discussion of the topic &amp; Problem solving INORGANIC ANALYSIS</b> Identification of Anions and Test of common acid radicals, Individual acid radicals or anions ( $\text{CO}_3^{2-}$ , $\text{HCO}_3^-$ , $\text{NO}_2^-$ ).
23/05/2022	28/05/2022	Individual acid radicals or anions ( $\text{S}^{2-}$ , $\text{SO}_3^{2-}$ , $\text{S}_2\text{O}_3^{2-}$ , $\text{Cl}^-$ , $\text{Br}^-$ ).
30/05/2022	04/06/2022	Individual acid radicals or anions ( $\text{I}^-$ , $\text{NO}_3^-$ , $\text{CH}_3\text{COO}^-$ , $\text{C}_2\text{O}_4^{2-}$ ).
06/06/2022	11/06/2022	Individual acid radicals or anions ( $\text{PO}_4^{3-}$ , $\text{BO}_3^{3-}$ , $\text{C}_4\text{H}_4\text{O}_6^{2-}$ , $\text{SO}_4^{2-}$ ) <b>Assignment work &amp; Viva-Voice based on Assignment.</b>
13/06/2022	18/06/2022	Theory Of Precipitation and Conditions for Precipitation Factors affecting solubility of precipitates.

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Department of Chemistry  
Name of Assistant Professor: Dr. Ashima  
B.Sc. 4th semester  
Subject: Physical Chemistry

Date		Topics/ Chapters to be covered
From	To	
21/03/2022	26/03/2022	<b>Thermodynamics</b> Concept of entropy- entropy as a state function, entropy change in a reversible & an irreversible process, physical significance of entropy.
28/03/2022	02/04/2022	Entropy changes during phase changes Entropy changes for an ideal gas with change in P, V & T. Entropy as a criterion of spontaneity & equilibrium, Entropy change on mixing of ideal gas.
04/04/2022	09/04/2022	<b>Revision and oral test.</b> Variation of Gibbs free energy & work function with Temperature & Pressure Criteria for the thermodynamic equation & spontaneity.
11/04/2022	16/04/2022	Advantage of free energy change criterion over entropy change Variation of G & A with P, V & T (Maxwell's Relations).
18/04/2022	23/04/2022	Gibbs Helmholtz equation, Purpose of third law of thermodynamics. Nernst Heat theorem, Third law of Thermodynamics Gibbs Helmholtz equation.
25/04/2022	30/04/2022	Purpose of third law of thermodynamics, Nernst Heat theorem, Third law of Thermodynamics. Concept of Residual entropy, evaluation of absolute entropy from heat capacity data.
02/05/2022	07/05/2022	<b>ELECTROCHEMISTRY</b> Electrolytic and galvanic cells, Conventional representation of electrochemical cells. E.M.F. of the cell & its measurement, Weston standard Cell.
09/05/2022	14/05/2022	Reversible Electrodes and its types Standard electrode potential and Measurement of standard electrode potentials using SHE. Electrochemical Series & its Applications, Relationship between electrical energy & Gibbs free energy.
16/05/2022	21/05/2022	Calculation of Thermodynamic quantities ( $\Delta G$ , $\Delta H$ , & $\Delta S$ ) of Cell Reactions. Concept of Activity & Activity coefficient, Mean activity coefficient. <b>Unit test and assignment.</b>
23/05/2022	28/05/2022	Nernst equation for EMF of a cell, Applications of Nernst equation Calculation of equilibrium constant using Nernst equation. Liquid Junction potential.
30/05/2022	04/06/2022	Applications of concentration cells (determination of activities & activity coefficients, valency of ions). Determination of Ph of a solution using Quinhydrone electrode, & using glass electrode.
06/06/2022	11/06/2022	Potentiometric Titrations: Principle, Acid-base titrations, Redox titrations.
13/06/2022	18/06/2022	Precipitation titrations & Advantages of Potentiometric Titrations.

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Department of Chemistry  
Name of Assistant Professor: Dr. Ashima  
B.Sc. 6th semester  
Subject: Organic Chemistry

Date		Topics/ Chapters to be covered
From	To	
21/03/2022	26/03/2022	<b>Heterocyclic compounds</b> Introduction- molecular orbital picture and aromatic characterization of pyrrole, furan, thiophene and pyridine.
28/03/2022	02/04/2022	Methods of synthesis and chemical properties of pyrrole.
04/04/2022	09/04/2022	Methods of synthesis and chemical properties of furan, thiophene and pyridine.
11/04/2022	16/04/2022	Mechanism of nucleophilic substitution reaction of pyridine, comparison of basicity of pyridine, piperidine, pyrrole.
18/04/2022	23/04/2022	Introduction to condensed heterocyclic.
25/04/2022	30/04/2022	Preparation and chemical reactions of indole and quinoline with special reference to Fischer-indole synthesis and Skarup synthesis.
02/05/2022	07/05/2022	Preparation and chemical reactions of isoquinoline with special reference to Bischler-Napieralski synthesis.
09/05/2022	14/05/2022	Group discussion and problem solving of heterocyclic compounds Class test of section A, B & C.
16/05/2022	21/05/2022	<b>Organo sulphur compounds</b> Nomenclature, structural features, Preparation and chemical reactions of thiols, thioethers, sulphonic acids, sulphonamides and sulphaguanidines. Study of synthetic detergents alkyl and aryl sulphonates.
23/05/2022	28/05/2022	<b>Organic synthesis via enolates</b> Introduction to alpha hydrogen, acidic character and formation of enolates, alkylation of diethyl malonate. Synthesis, alkylation of ethylacetoacetate, Keto-enol tautomerism, introduction of synthetic polymers.
30/05/2022	04/06/2022	<b>Synthetic polymers</b> Types of polymerization: free radical, addition, ionic, Ziegler-Natta polymerization, condensation polymerization, polyesters, polyamides.
06/06/2022	11/06/2022	Phenol-formaldehyde resin, urea-formaldehyde resin, epoxy resin. Natural and synthetic rubber.
13/06/2022	18/06/2022	<b>Amino acids, peptides and Proteins</b> Classification of amino acids, acid-base behavior, isoelectric point and electrophoresis. Preparation of alpha amino acid, structure of peptides and proteins, classification of proteins.
20/06/2022	25/06/2022	Peptide structure determination, end group analysis, classical and solid phase peptide synthesis.
27/06/2022	30/06/2022	Structure of proteins: primary and secondary structure.

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 Subject: Inorganic Chemistry

Date		Topics/ Chapters to be covered
From	To	
21/03/2022	26/03/2022	Definition, nomenclature and classification of organometallic compounds.
28/03/2022	02/04/2022	Preparation, properties and bonding of alkyls of Li, Al, Hg and Sn
04/04/2022	09/04/2022	A brief account of metal-ethylenic complexes, mononuclear carbonyls
11/04/2022	16/04/2022	Nature of bonding in metal carbonyls
18/04/2022	23/04/2022	Arrhenius, Bronsted-Lowry, the Lux-Flood concept
25/04/2022	30/04/2022	Solvent system and lewis concept of acid and bases
02/05/2022	07/05/2022	Relative strength of acid and bases, concept of hard and soft acid & bases
09/05/2022	14/05/2022	Essential and trace elements in biological process
16/05/2022	21/05/2022	Metalloporphyrins with special reference to haemoglobin and myoglobin
23/05/2022	28/05/2022	Biological role of alkali metal ions with special reference to Ca <sup>2+</sup> ion, Nitrogen fixation
30/05/2022	04/06/2022	Biological role of and alkaline earth metal ions.
06/06/2022	11/06/2022	<b>Seminar conducted on Orgtanometallics, Test of 1 and 2 chapter.</b>
13/06/2022	18/06/2022	Silicones and phosphazenes as examples of inorganic polymers
20/06/2022	25/06/2022	Nature of bonding in triphosphazenes
27/06/2022	30/06/2022	<b>Problem session and Revision of syllabus.</b>

**Government College for Women, Bahadurgarh**  
**Lesson plan, even semester Session**  
**Department of Chemistry**  
**Name of Assistant Professor: Dr. Ashima**  
**B.Sc. 6th semester**  
**Subject: Physical Chemistry**

Date		Topics/ Chapters to be covered
From	To	
21/03/2022	26/03/2022	<b>Electronic Spectroscopy</b> Introduction, Born-Oppenheimer Approximation, Nature of electronic band spectra.
28/03/2022	02/04/2022	Calculation of dissociation energy of molecules and Frank Condon principle.
04/04/2022	09/04/2022	Selection rule for electronic transitions, Types of molecular orbitals involved in electronic transitions and intensity of electronic bands.
11/04/2022	16/04/2022	<b>Photochemistry</b> Introduction and importance of photochemistry,
18/04/2022	23/04/2022	Laws governing absorption of light and some other terms commonly used in spectroscopy.
25/04/2022	30/04/2022	Quantum yield/Quantum efficiency, Reasons for high and Low quantum Yield.
02/05/2022	07/05/2022	Jablonski Diagram and its importance.
09/05/2022	14/05/2022	Main points of difference between fluorescence and phosphorescence.
16/05/2022	21/05/2022	Quenching of fluorescence- Stern volmer equation. Photosensitization-energy transfer process and Photoinhibitors, Photochemical equilibrium or photostationary state.
23/05/2022	28/05/2022	<b>Solutions, Dilute solution and Colligative properties</b> Introduction, Ideal and Non ideal solutions. (Assignment topic in extra lecture), Method of expressing concentration of solution.
30/05/2022	04/06/2022	Dilute solutions and Raoult's Law, Colligative property- Relative lowering of vapour pressure and its thermodynamic derivation.
06/06/2022	11/06/2022	Elevation in boiling point, Depression in freezing point and its thermodynamic derivation, Relationship of depression in freezing point with lowering of vapour pressure and experimental method for elevation in boiling point.
13/06/2022	18/06/2022	<b>Phase Equilibrium</b> Introduction, phase components and degrees of freedom. Thermodynamic derivation of Gibbs phase rule. Phase equilibrium of one component system example water and sulphur system.
20/06/2022	25/06/2022	Phase equilibrium of two component system example solid liquid equilibria system (Pb-Ag) system. Pattinson process for desilverisation of Lead.
27/06/2022	30/06/2022	<b>Revision and problem taking session.</b>