

Government College for Women, Hisar

Lesson Plan (2021-2022)

Chemistry Department

LESSON PLAN (Even Semester, Session 2021-22)

Name of Associate Professor: Dr. Satyender K. Yadav

CLASS: B.Sc. II (4th Semester) Paper: INORGANIC CHEMISTRY

<p>Week 1st & 2nd , April 2022 Chapter: Transition Metals: Group trend, E.C., Valency, Color and magnetic Properties, Catalytic Properties, Complex formation, Stability of various oxidation states (Latimer diagrams) for Mn, Fe & Cu</p>
<p>Week 3rd & 4th April. 2022 Chapter : Lanthanides & Actinides: E.C., O.S., Color & Magnetic Properties, Lanthanide contraction, Separation of Lanthanides: Ion Exchange Method</p>
<p>Week 1st & 2nd May. 2022 Chapter: Coordination Chemistry: VBT, Inner & outer orbital complexes of Cr, Fe, Co, Ni & Cu, Structural & stereoisomerism in complex of CN 4 & 6, Drawbacks of VBT, IUPAC Nomenclature</p>
<p>Week 3rd & 4th May 2022 Chapter: Crystal Field Theory: Crystal field effect, octahedral symmetry, CFSE, Tetrahedral symmetry, Factors affecting splitting, spectrochemical series, Tetragonal distortion, John- Teller distortion, square planar distortion</p>
<p>Week 1st & 2nd June.2022 Chapter:. Revision of Chapter 1 & 2</p>
<p>Week 3rd & 4th June.2022 Chapter: Revision of Chapter 3c & 4</p>

Dr. S.K. Yadav

Government College for Women, Hisar

Lesson Plan (2021-2022)

Name PARVEEN RANI

Department: Chemistry

Class: BSc- 1stNM &Med (2nd Sem)

Paper: CCL-205 ORGANIC CHEMISTRY

S.No	Date	Topics
1	April 2022	AROMATIC HYDROCARBONS: Preparation from Phenol, by decarboxylation, from acetylene, from benzene sulphonic acid. Reactions: Electrophilic Substitution- nitration, halogenation, sulphonation and Friedal Craft reactions (alkylation and acylation), side chain oxidation of alkyl benzene.
2	May 2022	Alkyl Halides (Upto 5 Carbons) Types of Nucleophilic Substitution (S_N1, S_N2 and S_Ni) reactions. <i>Preparation</i> : from alkenes and alcohols. <i>Reactions</i> : hydrolysis, nitrite & nitro formation, nitrile & isonitrile formation. Williamson's ether synthesis : Elimination vs substitution. Aryl Halides Preparation : (Chloro, bromo and iodo-benzene case) : from phenol, Sandmeyer & Gattermann reactions. <i>Reactions (Chlorobenzene)</i> : Aromatic nucleophilic substitution (replacement by -OH group) and effect of nitro substituent. Benzyne Mechanism : KNH_2/NH_3 (or $NaNH_2/NH_3$). Reactivity and Relative strength of C-Halogen bond in alkyl, allyl, benzyl, vinyl and aryl halides.
3	June 2022	Alcohols, Phenols and Ethers (Upto 5 Carbons) Alcohols : <i>Preparation</i> : Preparation of 1°, 2° and 3° alcohols : using Grignard reagent, Ester hydrolysis, Reduction of aldehydes, ketones, carboxylic acid and esters. <i>Reactions</i> : With sodium, HX (Lucas test), esterification, oxidation (with PCC, alk. $KMnO_4$, acidic dichromate, conc. HNO_3). Oppeneauer oxidation Diols : (Upto 6 Carbons) oxidation of diols. Pinacol-Pinacolone rearrangement. Phenols : (Phenol case) <i>Preparation</i> : Cumene hydroperoxide method, from diazonium salts. <i>Reactions</i> : Electrophilic substitution : Nitration, halogenation and sulphonation. Reimer-Tiemann Reaction, Gattermann-Koch Reaction, Houben-Hoesch Condensation, Schotten-Baumann Reaction. Ethers (aliphatic and aromatic) : Cleavage of ethers with HI.
4	July 2022	Aldehydes and ketones (aliphatic and aromatic) (Formaldehyde, acetaldehyde, acetone and benzaldehyde) <i>Preparation</i> : from acid chlorides and from nitriles. <i>Reactions</i> - Reaction with HCN, ROH, $NaHSO_3$, NH_2-G derivatives. Iodoform test. Aldol Condensation, Cannizzaro's reaction, Wittig reaction, Benzoin condensation. Clemensen reduction and Wolff-Kishner reduction. Meerwein-Ponndorf-Verley reduction.

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Lesson Plan (2021-2022)

Name: VIRENDER SINGH

Department: Chemistry

Class: BSc- 1stMED & NM (2ndSem)

Paper: CCL-204 Physical Chemistry-1

S.No	Date	Topics
1	April 2022	Chemical Equilibrium:Free energy change in a chemical reaction.Thermodynamic derivation of the law of chemical equilibrium.Distinction between free energy change and free energy change in std state. Le chatelier'sprinciple.Relationships between K_p , K_c , K_x , K_a for reaction involving ideal gases.
2	May 2022	Ionic equilibria:Strong,moderate and weak electrolye,degree of ionization,factor affecting degree of ionization,ionization constant and ionic product of water.ionization of weak acid and base,Phscale,common ion effect.
3	June 2022	Ionic equilibria-2:Salt hydrolysis-calculation of hydrolysis constant,degree of hydrolysis and pH for different salt.Buffersolution.Solubility and solubility product of sparingly soluble salts.Application of solubility product principle. Chemical Energetics;Review of thermodynamic and law of thermodynamics.important principles and definitionofthermochemistry.concept of std state and stdenthalpies.calculation of bond energy bond dissociation energy and resonace energy from therodynamicaldata.variation of reaction with temp kichhoff'sequation.AND REVISION

Government College for Women, Hisar

Lesson Plan (2021-2022)

Name VIRENDER SINGH

Department: Chemistry

Class: BSc- 2nd NM (4thSem)

Paper: CCL-405 Physical Chemistry 3

S.No	Date	Topics
1	April 2022	Forms of solid.symmetryelements,unitcell,crystalsystems,Bravais lattice types and identification of lattice planes.Law of crystallography,Law of constancy of interfacial angles,law of rational indices.Miller indices X-ray diffraction of crystal.Bragg's Law.
2	May 2022	The concept of reaction rates.Effect of temp,presure,catalyst and Other factors on reaction rates.Order and molecularity of a reaction.Derivation of integrated rate equation for zero order,first,and second order reaction.
3	June 2022	Liquids state-surface tension and its determination using stalagmometer. Viscosity of liquid and determination of coefficient of viscosity using Ostwald viscometer.effect of tem on surface tension and coefficient of viscosity. Postulates of kinetic theory of gases and derivation of kinetic gas equation.Derivation of real gas from ideal behaviour,Maxwell Boltzmann distribution laws of molecular velocities and molecular energies and their imp.collisin number, collision frequency,collisiosdiameter,and mean free path.AND REVISION

Government College for Women, Hisar

Lesson Plan (2021-2022)

Name – Parveen Rani

Department: Chemistry

Class: BSc- 2nd Med (4thSem)

Paper: CCL-405 Physical Chemistry 3

S.No	Date	Topics
1	April 2022	Forms of solid.symmetryelements,unitcell,crystalsystems,Bravais lattice types and identification of lattice planes.Law of crystallography,Law of constancy of interfacial angles,law of rational indices.Miller indices X-ray diffraction of crystal.Bragg's Law.
2	May 2022	The concept of reaction rates.Effect of temp,presure,catalyst and Other factors on reaction rates.Order and molecularity of a reaction.Derivation of integrated rate equation for zero order,first,and second order reaction.
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Government College for Women, Hisar
LESSON PLAN (Even Semester, Session 2021-22)

Name: Dr. Priyanka

CLASS: B.Sc. III NM (6th Semester)

Paper: CCL-603 (i) DSC-III (i) Organometallics And Bioinorganic Chemistry

CCL-604 (i) DSC-IV (i) Polynuclear Hydrocarbons And UV, IR Spectroscopy

Week 1st & 2nd, April 2022

UNIT-I Chemistry of 3d metals Oxidation states displayed by Cr, Fe, Co, Ni and Co. A study of the following compounds (including preparation and important properties); Peroxo compounds of Cr, $K_2Cr_2O_7$, $KMnO_4$, $K_4[Fe(CN)_6]$, sodium nitroprusside, $[Co(NH_3)_6]Cl_3$, $Na_3[Co(NO_2)_6]$.

UNIT-I I Organometallic Compounds Definition and Classification with appropriate examples based on nature of metalcarbon bond (ionic,s,p and multicentre bonds). Structures of methyl lithium.

Week 3rd & 4th April. 2022

Chapter : Zeiss salt and ferrocene. EAN rule as applied to carbonyls. **UNIT-III** Preparation, structure, bonding and properties of mononuclear and polynuclear carbonyls of 3d metals.p-acceptor behaviour of carbon monoxide. Synergic effects (VB approach)-(MO diagram of CO can be referred to for synergic effect to IR frequencies). **UNIT-IV** Bio-Inorganic Chemistry A brief introduction to bio-inorganic chemistry. Role of metal ions present in biological systems with special reference to Na^+ , K^+ and Mg^{2+} ions: Na/K pump. **Assignment , Test**

Week 1st & 2nd May. 2022

Role of Mg^{2+} ions in energy production and chlorophyll. Role of Ca^{2+} in blood clotting, stabilization of protein structures and structural role (bones).

UNIT-I Polynuclear and heteronuclear aromatic compounds: Properties of the following compounds with reference to electrophilic and nucleophilic substitution: Naphthalene, Anthracene, Furan, Pyrrole, Thiophene, and Pyridine.

UNIT-II Active methylene compounds: Preparation: Claisen ester condensation. Keto-enol tautomerism. Reactions: Synthetic uses of ethyl acetoacetate (preparation of non-hetero molecules having upto 6 carbon). **Assignment**

Week 3rd & 4th May 2022

UNIT-III Application of Spectroscopy to Simple Organic Molecules Application of visible, ultraviolet and infrared spectroscopy in organic molecules. Electromagnetic radiations, electronic transitions, λ_{max} & ϵ_{max} , chromophore, auxochrome, bathochromic and hypsochromic shifts. Application of electronic spectroscopy and Woodward rules for calculating λ_{max} of conjugated dienes and α,β -unsaturated compounds. **Test**

Week 1st & 2nd June.2022

UNIT-IV Infrared radiation and types of molecular vibrations, functional group and fingerprint region. IR spectra of alkanes, alkenes and simple alcohols (inter and intramolecular hydrogen bonding), aldehydes, ketones, carboxylic acids and their derivatives (effect of substitution on $>C=O$ stretching absorptions).

Week 3rd & 4th June.2022

Chapter: Revision

