

Sample Format (Lesson Plan)

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

Name of the Teacher/s: 1. Dr. Shefali
2. Dr. Rishu

Department: P.G. Department of Chemistry

Class: M.Sc. 3rd Semester **Subject:** Applications of Spectroscopy CH-511 **Section (s) -**

| Teacher | Date (Monthly) | | Topics to be Covered | Academic Activity Undertaken* |
|---------|----------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| | From | To | | |
| 1. | 23-07-2019 | 31-07-2019 | Electron Spin Resonance Spectroscopy: Hyperfine coupling, spin polarization for atoms and transition metal ions, spin orbit coupling and significance of g-tensors, application of transition metal complexes (having one unpaired electron) including biological systems and to inorganic free radicals such as PH_4 , F_2 and $[\text{BH}_3]$. | Lecture Method, PPT) Case Studies and Online Sources |
| 2. | 23-07-2019 | 31-07-2019 | Ultraviolet and Visible Spectroscopy : Various electronic transitions (185-800nm), Beer-Lambert law, effect of solvent on electronic transition, ultraviolet bands for carbonyl compounds, unsaturated carbonyl compounds, dienes, conjugated polyenes. Fieser-Woodward rules for conjugated dienes and carbonyl, ultraviolet spectra of aromatic and heterocyclic compounds. Steric effect in biphenyles. | Lecture Method, PPT and Group Discussion |
| 1. | 01-08-2019 | 31-08-2019 | Nuclear Magnetic Resonance of Paramagnetic: Substances in Solution The contact and pseudo contact shifts, factors affecting nuclear relaxation | Lecture Method, PPT and Online Sources |

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| | | | Some applications including biochemical systems , an overview of NMR of metal nuclides with emphasis on ^{195}Pt and ^{119}Sn NMR. | |
| 2 | 01-08-2019 | 31-08-2019 | <p>Infrared Spectroscopy: Instrumentation and sample handling. Characteristics vibrational frequencies of alkanes, alkenes, alkynes, aromatic compounds, alcohols ,ethers phenols and amines .Detailed study of vibrational frequencies of carbonyl compounds (ketones, aldehydes, esters amids acids, anhydrides, lactones, lactans and conjugated carbonyl compounds). Effect of hydrogen bonding of solvent effect on vibrational frequencies, overtones, combination bands and Fermi resonance. FT-IR of gaseous, solid and polymeric materials.</p> <p>Nuclear Magnetic Resonance Spectroscopy : General introduction and definition, chemical shift, spin spin interaction, shielding mechanism of measurement, chemical shift values and correlation for protons bonded to carbon (aliphatic,olefinic,aldehydic and aromatic) another nuclei (alcoholic, phenols, enols, carboxylic acids, amines, amides &mercapto),chemical exchange.</p> | Lecture Method, PPT and Group Discussion |
| 1 | 02-09-2019 | 30-09-2019 | <p>Mossbauer Spectroscopy: Basic principles, spectral parameters and spectrum display. Application of the technique to the studies of (1) bonding and structures of Fe^{+2} and Fe^{+3} compounds including those of intermediate spin , (2) Sn^{+2} and Sn^{+4} compounds- nature of M-L bond, coordination number, structure and (3) detection of oxidation state and inequivalent MB atoms.</p> | Lecture Method, , PPT Case Studies and Online Sources) |
| 2 | 02-09-2019 | 30-09-2019 | Effect of deuteration,complex spin-spin interaction between two, three, four, five nuclei (first order spectra) virtual coupling, stereochemistry, hindered rotation, karplus curve variation of coupling constant with dihedral angle. simplification of complex spectra- nuclear | Lecture Method, PPT and Group Discussion |

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| | | | magnetic double resonance, contact shift reagents, solvent effects, fourier transform technique, nuclear overhauser effect (NOE) resonance of other nuclei –F,P | |
| 1 | 1-10-2019 | 31-10-2019 | Vibrational Spectroscopy: Symmetry and shapes of AB ₂ , AB ₃ , AB ₄ , AB ₅ and AB ₆ mode of bonding of ambidentate ligands. Ethylenediamine and diketonato complexes, applications of resonance | Lecture Method and Online Sources |
| 2 | 1-10-2019 | 31-10-2019 | Carbon-13 NMR spectroscopy : General consideration chemical shift (aliphatic olefinic alkyne aromatic heteroaromatic and carbonyl carbon) coupling constants. Two dimension NMR spectroscopy –COSY, NOESY, DEPT, APT and INADEQUATE technique. | Lecture Method, PPT and Group Discussion |
| 1 | 1-11-2019 | 20-11-2019 | Raman spectroscopy particularly for the study of active sites of metalloproteins. | Lecture Method and Online Sources |
| 2 | 1-11-2019 | 20-11-2019 | NMR spectroscopy –COSY, NOESY, DEPT, APT and INADEQUATE technique. Mass Spectrometry: Introduction, ion production – EI, CI, FD and FAB, factors affecting fragmentation, ion analysis, ion abundance. Mass spectral fragmentation of organic compounds, common functional group, molecular ion peak, metastable peak, McLafferty rearrangement. nitrogen rule, high resolution mass spectrometry. Example of mass spectral fragmentation of organic compounds with respect to their structure determination. | Lecture Method, PPT 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

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

Name of the Teachers: Dr. Madhuri Tanaji Patil

Department: P.G. Department of Chemistry

Class: M.Sc II

Subject: Heterocyclic Chemistry (CH-513)

| Date (Monthly) | | Topics to be Covered | Academic Activity Undertaken* |
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| From | To | | |
| 24.07.19 | 31.07.19 | UNIT 1: Nomenclature of Heterocycles Replacement and systematic nomenclature (Hantzsch-widman System) for monocyclic fused and bridged heterocycles Aromatic Heterocycles. General chemical behavior of aromatic heterocycles classification (structural type) criteria of aromaticity(bond length ring current and chemical shift in ¹ H NMR- Spectra empirical resonance energy delocalization energy and Dewar resonance energy Diamagnetic susceptibility exaltations) <i>Non- aromatic Heterocycles</i> . Strain-bond angle and torsional strains and their consequences in small ring heterocycles. | Lecture Method & Group Discussion about Introduction to relevant reference books And marking system in final paper |
| 1.08.19 | 31.08.19 | UNIT 1: Nomenclature of Heterocycles Conformation of six-membered heterocycles with reference to molecular Geometry, barrier to ring inversion, pyramidal inversion and 1,3-diaxial interaction. Stereo-electronic effects- anomeric and related effects Attractive interactions-hydrogen bonding and intermolecular nucleophilelectrophilic interactions. UNIT 2: Heterocyclic synthesis Principles of heterocyclic synthesis involving cyclization reactions and cycloaddition Reactions. Three- membered and four-membered heterocycles-synthesis and reactions of aziridines, oxiranes, thiiranes, azetidines, oxetanes and thietanes. Synthesis and reaction including medicinal applications of benzopyrroles, benzofurans and benzothiophenes | Lecture Method & Case Studies. For Practice of nomenclature |
| 2.09.19 | 30.09.10 | UNIT 3: Meso-ionic Heterocycles General classification chemistry of some important meso-ionic heterocycles of type-A and B and their applications. <i>Six-Membered Heterocycles With One Heteroatom</i> Synthesis and reactions of pyrylium salt and pyrones and their comparison with Pyridinium & thiopyrylium salt and Pyridones synthesis and reactions of Quinolizinium and benzopyrylium salt coumarins and chromones <i>Six-Membered Heterocycles with Two or More Heteroatoms</i> : Synthesis and reactions | Lecture Method & Group Discussion for paper solving by giving Assignment |

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| | | of diazines, triazines, tetrazines and thiazines Unit 4: 1,2-Azoles: pyrazoles, isothiazoles and isoxazoles Introduction to 1,2-azoles, synthesis of 1,2-azoles. Addition on nitrogen: protonation, N-alkylation, N-acylation. Reaction with electrophilic and nucleophilic reagents. Reaction with bases: reaction of N-metallated pyrazole, reaction of C-metallated 1,2-azoles. Reaction with oxidizing and reducing agents. | |
| 1.10.19 | 20.10.19 | Unit 4: 1,3-Azoles: imidazoles, thiazoles and oxazoles Introduction to 1,3-azoles, synthesis of 1,3-azoles. Addition at nitrogen: protonation, N-alkylation, N-acylation. Reaction with electrophilic and nucleophilic reagents. Reaction with bases: reaction of N-metallated imidazole, reaction of C-metallated 1,3-azoles. Reaction with oxidizing and reducing agents. Synthesis and reaction of quaternary 1,3-azolium salt and 1,3-azole-N-oxide. | Lecture Method & group Discussion. Revision and question papers 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

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

Name of the Teacher/s: Dr. Aanchal Batra (AB)

Department: Post Graduate Department of Chemistry

Class: MSc II (Sem.III), Subject: Organotransition Metal Chemistry, Section (s): July-Dec. 2019

| S.No. | Date (Monthly) | | Topics to be Covered | Academic Activity Undertaken* |
|-------|-------------------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|
| | From | To | | |
| 1 | 24-07-2019 | 31-08-2019 | Fluxional Organometallic Compounds(AB) Fluxionality and dynamic equilibria in compounds such as η^2 olefin, η^2 Allyl and dienyl Complexes | Lecture Method and Online Sources |
| | | | Compounds of Transition Metal Carbon multiple Bonds(DJ) Alkylidenes, alkylidyne, low valent Carbenes and carbynes-Synthesis, nature of bond, Structural Characteristics, nucleophilic and Electrophilic reaction on the ligands, role in organic synthesis | Lecture Method, Online Sources and Group discussions |
| 2 | 02-09-2019 | 30-09-2019 | Alkyls and Aryls of Transition Metals(AB) Types, routes of synthesis, Stability and decomposition Pathways, organocopper in Organic Synthesis | Lecture Method, Group discussions and assignments |

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| | | | Transition Metal Compounds with Bonds to Hydrogen(DJ) Transition metal Compounds with bonds to hydrogen | Lecture Method, Class seminars, Unit test |
| 3 | 01-10-2019 | 31-10-2019 | Homogeneous Catalysis(AB) Stoichiometric reaction for catalysis, homogeneous catalytic hydrogenation, | Lecture Method and Diagrammatic Representations |
| | | | Transition Metal Complexes of alkenes, alkynes, allyls(DJ) Transition Metal Complexes with unsaturated Organic molecules, alkenes, alkynes, Allyl, diene, dienyl, arene and trienyl complexes, preparations, properties, nature of bonding and structural features important reactions relating to nucleophilic and electrophilic attack on ligands and to organic synthesis | Lecture Method, assignments, Class seminars |
| 4. | 01-11-2019 | 30-11-2019 | Homogeneous Catalysis (cont.) (AB) Zeigler-Natta polymerization of olefins, catalytic reactions involving carbon monoxide such as hydrocarbonylation of olefins (oxo reaction) oxopalladation reactions, activation of C-H bond | Lecture Method and Diagrammatic Representations |
| | | | Transition Metal Complexes of dienyls, arenes & trienyls(DJ) Preparations, properties, | Lecture Method, Class seminars, Unit test |

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| | | | nature of bonding and structural features important reactions relating to nucleophilic and electrophilic attack on ligands and to organic synthesis | |
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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

LESSON PLAN

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

Name of the Teacher/s: Dr. Aanchal Batra (AB) & Dr. Dhanya James (DJ)

Department: Post Graduate Department of Chemistry

Class: MSc II (Sem.IV), Subject: Biophysical Chemistry Section (s): Jan-April 2020

| S.No. | Date (Monthly) | | Topics to be Covered | Academic Activity Undertaken* |
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| | From | To | | |
| 1 | 09-01-2020 | 31-01-2020 | Biological Cell and its Constituents (AB) Biological cell, DNA and RNA in living systems. Basic consideration. Proximity effects and molecular adaptation | Lecture Method and Online Sources |
| | | | Bioenergetics and ATP cycle (DJ) Standard free energy change in biochemical reaction, exergonic, endergonic reactions. Hydrolysis of ATP, synthesis of ATP from ADP, metal complexes and transition of energy, chlorophylls, photo system I and photo system II in cleavage of water | Lecture Method, PPT, Assignments, Unit test |
| 2 | 01-02-2020 | 29-02-2020 | Enzymes, Mechanism of Enzyme Action(AB) Introduction and historical perspective, chemical and biological catalysis, Remarkable properties of enzymes like catalytic | Lecture Method, Group discussions and assignments |

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| | | | <p>power, specificity and regulation. Nomenclature and classification, extraction and purification. Fischer's lock and key and Koshland's induced fit hypothesis, concept and identification of active site by the use of inhibitors, affinity labeling and enzyme modification by site-directed mutagenesis . Enzyme kinetics, Michaelis-Menten and Lineweaver-Burk plots, reversible and irreversible inhibition.</p> | |
| | | | <p>Thermodynamics of biopolymer solutions, Cell membranes and transport of ions(DJ) Thermodynamics of biopolymers solutions, osmotic pressure, membrane equilibrium, muscular contraction and energy generations in mechanochemical system. Structure and function of cell membrane, ion transport through cell membrane, Na⁺ /K⁺ Pump. Irreversible treatment of membrane transport. Nerve conduction.</p> | Lecture Method, PPT, Group discussions |
| 3 | 02-03-2020 | 31-03-2020 | <p>Kinds of reactions Catalysed by Enzymes, Co-enzyme Chemistry(AB) Nucleophilic displacement on a phosphorus atom, multiple displacement</p> | Lecture Method and Diagrammatic Representations |

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| | | <p>reactions and the coupling of ATP cleavage to endergonic processes. Transfer of sulphate, addition and elimination reaction, enolic intermediates in isomerization reactions, β-cleavage and condensation, some isomerization and rearrangement reactions. Enzyme catalyzed carboxylation and decarboxylation</p> <p>Cofactors as derived from vitamins, coenzymes, prosthetic groups, apoenzymes. Structure and biological function of coenzyme A, thiamine pyrophosphate, Pyridoxal phosphate, NAD⁺, NADP⁺, FMN, FAD, lipoic acid, vitamin B12. Mechanism of reaction catalyzed by the above cofactors</p> | |
| | | <p>Biological macromolecules, interactions & structural transitions(DJ)</p> <p>Nucleotide, torsion angles in poly nucleotide chains, the helical structure of polynucleic acids, high order structure in polynucleotides. Basic principles of interaction between molecules, water structure and its interaction with biomolecules, dipole interactions, side chain interactions, electrostatic interactions, base pairing in nucleic acids, base</p> | <p>Lecture Method, PPT, Assignments, Unit test</p> |

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| | | | stacking, hydration and the hydrophobic effect. Coil – helix transitions in proteins, statistical methods for predicting protein secondary structures; melting and annealing of polynucleotide duplexes, helical transitions in double stranded DNA, super coil dependent DNA transitions predicting helical structures in genomic DNA. | |
| 4 | 01-04-2020 | 20-04-2020 | <p>Biological Macromolecules, Proteins(AB) Basic features of macromolecules, their configurations and conformations. Amino acids, the unique protein sequence, secondary structures of proteins, helical symmetry, effect peptide bond on protein conformations, the structure of globular proteins.</p> <p>Separation & Characterization of biological macromolecules(DJ) Sedimentation, moving boundary sedimentation, zonal sedimentation, general principles of electrophoresis, electrophoresis of proteins and nucleic acids, capillary electrophoresis.</p> | <p>Lecture Method Diagrammatic Representations, Referred many books</p> <p>Lecture Method, PPT, Class seminars by students</p> |

*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 (4th Semester)
Session – (2019-20)

Name of the Teacher/s: Dr. Swatika Sharma

Department : Chemistry

Class: M.Sc. II

Subject Chemistry of Natural Products

| S.No. | Date (Monthly) | | Topics to be Covered | Academic Activity Undertaken* |
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| | From | To | | |
| 01 | 9 th Jan, 2020 | 31 st Jan, 2020 | Unit 1: <u>Terpenoids and Carotenoids</u> Classification, nomenclature occurrence isolation general methods of structure determination, isoprene rule. Structure determination stereochemistry, Biosynthesis and synthesis of : citral, Terpeneol, Farnesol, santonin, phytol, Abietic Acid and Beta- Carotene. | Lecture method, Online sources |
| 2 | 1 st Feb, 2020 | 29 th Feb, 2020 | Unit-II: <u>Alkaloids:</u> Definition, nomenclature and physiological action occurrence isolation general method of structure elucidation degradation classification | Lecture method |

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| | | | <p>based on nitrogen heterocyclic ring role of alkaloids in plants.</p> <p>Structure stereochemistry, synthesis and biosynthesis of: Ephedrin, Conine, Nicotine, Atropine, Quinine and Morphine.</p> | |
| 3 | 2 nd March, 2020 | 31 st March, 2020 | <p>Unit-III: <u>Steroids</u></p> <p>Occurrence nomenclature basic skeleton. Diel's hydrocarbon and Stereochemistry, isolation, structure determination and synthesis of: Cholesterol, Bile acids, Androsterone, Testosterone, Estrone, Progesterone, Aldosterone, Biosynthesis of steroids.</p> | Lecture Method, Online Sources |
| 4 | 1 st April, 2020 | 20 th April, 2020 | <p>Unit-IV: Plant pigments</p> <p>Occurrence nomenclature and general methods of structure determinations, isolation and synthesis of: Quercetin, Quercetin-3-Glucoside, Vitexin, Diadzein, Cyanidin-7-arabinoside, cyanidine, Hirsutidin.</p> <p>Biosynthesis of Flavonoids: Acetate pathway and shikimic acid pathway.</p> <p>Porphyryns: structure and synthesis of haemoglobin and chlorophyll</p> | Lecture Method |

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| | | | Prostaglandins: Occurrence , nomenclature biogenesis and synthesis of: PGE2 and PGF2 Synthesis and reaction of Pyretheroids and Rotenones. | |
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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

Lesson Plan

MCM DAV College for Women, Sector – 36A, Chandigarh
Monthly Teaching Plans (4th Semester)
Session – (2020-20)

Name of the Teachers: 1. Dr. Qudrat Hundal (Unit II, IV & Unit III Oxidation)
2. Dr. Madhuri Tanaji Patil (Unit I, Unit III Reduction)

Department: P.G. Department of Chemistry

Class: M.Sc II

Subject: Organic Synthesis I (CH-522)

| Teacher | Date (Monthly) | | Topics to be Covered | Academic Activity Undertaken* |
|---------|----------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| | From | To | | |
| 1 | 09.01.20 | 31.01.20 | Unit II Organic Synthesis: Introduction to Retrosynthesis, Electrophilic substitution reactions, Discussion of possible retrosynthesis routes of a target molecule and their comparison, Latent polarity, Linear and Convergent synthesis, Umpolung and synthesis of cyclic molecules. | Lecture method PPT Group Discussion |
| 2 | 09.01.20 | 31.01.20 | Unit I: Organometallic Reagents Principle, Preparations, of the Organolithium and organomagnesium compounds in organic synthesis with mechanistic details. | Lecture method & Group discussion |
| 1 | 01.02.20 | 29.02.20 | Unit II Organic Synthesis: Functional Group Interconversions (FGIs), Retrosynthesis: Strategy and Planning, Practice examples elucidating all principles, Chemoselectivity, Protecting groups laying more emphasis on protection of carbonyl groups, alcohols and amines. Protection of just one of two identical groups. How to avoid the use of protecting groups and its advantages and disadvantages. Regioselectivity, Methods | Lecture method Group Discussion |

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| | | | for the preparation of alkenes, regioselective additions to alkenes, ketones, nucleophilic addition to α,β -unsaturated carbonyl compounds, nucleophilic addition to epoxides, Oxidation of ketones to esters and Practice examples | |
| 2 | 01.02.20 | 29.02.20 | Unit I: properties and applications Organolithium and organomagnesium compounds : Hg, Zn and Ce Compounds Transition metals: Cu,Pd,Ni, Fe , Co, Rh ,Cr and Ti Compounds | Lecture method & Group discussion |
| 1 | 02.03.20 | 31.03.20 | Unit II Organic Synthesis: Stereoselectivity, Stereospecific reactions and stereoselective reactions, Cram's rule and Falkin-Ahn model and discussion of practice examples. Unit III Oxidation: Introduction, Oxidation of alkenes i.e. Epoxidation, Perhydroxylation using KMnO_4 , OsO_4 , Oxidation with iodine and silver carbonate (Woodward reaction and Prevost reaction), Wacker process, oxidative cleavage of double bond, Lemieux reagent, Oxidation of Aromatic rings and Aromatic amines, Oxidation of saturated C-H groups (activated and unactivated), Oxidation of alcohols by chromic acid, DMSO, Ders-Martin reagent, MnO_2 , silver carbonate, Oppenauer oxidation. Oxidation of diols, oxidation of aldehydes and ketones. | Lecture method Group Discussion Assignment given Lecture method Presentation using OHP Presentation by students |
| 2 | 02.03.20 | 31.03.20 | Unit I: Other elements : Si ,B and iodine (I) Compounds Unit IV: Reduction Introduction Different reductive processes Hydrocarbons-alkanes, alkenes, alkynes and aromatic rings carbonyl compounds-aldehydes, ketones, acids and their derivatives. | Lecture Method, PPT, used online sources & Assignments; class tests |
| 1 | 01.04.20 | 30.04.20 | Unit III Oxidation: Oxidation of Carboxylic acids,amines, hydrazines and sulphides. Oxidation with Ruthenium Tetroxide, Thallium nitrate and iodobenzene diacetate. | Lecture method Presentation using OHP Presentation by students Assignment given |

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| | | | Unit IV Rearrangements: Introduction, migratory aptitude, memory effects, Pinacol-pinacolone rearrangement, Wagner Meerwein, Demjanov, Wolff, Beckmann, Hoffmann, Curtius, Schmidt, Baeyer-villiger, Neber, Shapiro, Favorskii and benzilic rearrangements. | Lecture method Assignment given Question papers discussed. |
| 2 | 01.04.20 | 30.04.20 | Unit III: Reduction epoxides. nitro, nitroso, azo and oxime groups. Hydrogenolysis. | Lecture method, PPT, Online sources & Revision |

*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 (4th Semester)
Session – (2019-20)

Name of the Teacher/s: New Teacher

Department : Chemistry Class_M.Sc. II__ Subject: Photochemistry & Solid State Chemistry

| S.No. | Date (Monthly) | | Topics to be Covered | Academic Activity Undertaken* |
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| | From | To | | |
| 1 | 9 th January, 2020 | 31 st January, 2020 | Unit 3: Solid state Chemistry Solid state reactions: general principles, experimental procedures, co-precipitation as a precursor to solid state reactions, kinetics of solid state reactions. Organic Solids: Electrically conducting solids, organic charge transfer complexes, organic metals, new superconductors. | Lecture method, Online sources |
| 2 | 1 st February, 2020 | 29 th February, 2020 | Crystal defects and non- stoichiometry: Perfect and imperfect crystals, intrinsic and extrinsic defects-point defects, line defects, vacancies- Schottky defects and Frenkel defects, Thermodynamics of | Lecture method |

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| | | | Schottky defects and Frenkel defect formation, Colour Centres, non-stoichiometry and defects. | |
| 3 | 2 nd March, 2020 | 31 st March, 2020 | Unit 4 Electronic properties and Band Theory Metals, insulators and semiconductors, electronic structure of solids-band theory of metals, insulators and semiconductors, intrinsic and extrinsic semiconductors, doping semiconductors, p-n junctions, superconductors. | Lecture Method, Online Sources |
| 4 | 1 st April, 2020 | 30 th April, 2020 | Optical properties- Optical reflectance, photoconduction- photoelectric effects. Magnetic properties- Classification of materials: Quantum theory of paramagnetics-cooperative phenomena-magnetic domains, hysteresis. | Lecture Method |
| 5 | 1 st May, 2020 | 9 th May, 2020 | Revision and Solution of previous years' question papers | |

***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