

E.M. GOPALAKRISHNA KONE YADAVA WOMEN'S COLLEGE

**An Autonomous Institution -Affiliated to Madurai Kamaraj University
Re-accredited (3rd Cycle) with Grade A⁺ & CGPA 3.51 by NAAC**



**LESSON PLAN
2023-2024**

DEPARTMENT OF CHEMISTRY

(UG – Odd & Even Semester)



E.M.G. YADAVA WOMEN'S COLLEGE, MADURAI – 625 014.

(An Autonomous Institution – Affiliated to Madurai Kamaraj University)

Re-accredited (3rd Cycle) with Grade A⁺ & CGPA 3.51 by NAAC

DEPARTMENT OF CHEMISTRY

TUTOR WARD 2023-2024

| SL.No | Reg.,No | Class | No.of Students | Staff Incharge | Signature |
|-------|----------------------------|----------------|----------------|--------------------|-----------|
| 1 | 23CHE01- 23CHE30 | I BSC CHE | 30 | Mrs. K.Punitha | |
| 2 | 22CHE01-31 22CHE05 Left | II BSC CHE | 30 | Mrs. V. Gokilaa | |
| 3 | 21CHE01-32 | III BSC CHE | 30 | Dr. (Mrs) A. Ramya | |

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LESSON PLAN
2023-2024

Class : I BSc Chemistry

Sem : I

Course . Code : 23OUCH11

Title of the Paper : General Chemistry-I

Total Hours : 75hrs

| Month | Unit | Description of the Syllabus | Class | Hours Allocated | Teaching Mode & Methods | Course Teacher Signature |
|-------|------|---|-----------|-----------------|---------------------------------------|--------------------------|
| July | I | Unit –I Atomic structure and Periodic trends : History of atom (J.J.Thomson, Rutherford); Moseley's Experiment and Atomic number, Atomic Spectra; Black-Body Radiation | I BSc Che | 5 | Chalk and Talk, PPT | J. Dlakkiya Pavithra |
| | | and Planck's quantum theory Bohr's model of atom; The Franck-Hertz Experiment; Interpretation of Hspectrum; Photoelectric effect, Compton effect; Dual nature of Matter- DeBroglie wavelength-Davisson and Germer experiment Heisenberg's Uncertainty Principle; | I BSc Che | 5 | Chalk and Talk, PPT | J. Dlakkiya Pavithra |
| | | Electronic Configuration of Atoms and ions- Hund's rule, Pauli's exclusion principle and Aufbau principle; Numerical problems involving the core concepts. | I BSc Che | 5 | Chalk and Talk, PPT | J. Dlakkiya Pavithra |
| Aug | II | Unit –II Introduction to Quantum Mechanics: Classical mechanics, Wave mechanical model of atom, distinction between a Bohr orbit and orbital; Postulates of quantum mechanics; probability interpretation of wavefunctions, Formulation of Schrodinger wave equation - Probability and electron density-visualizing the orbitals -Probability density and significance of Ψ and Ψ^2 . | I BSc Che | 7 | Chalk and Talk, PPT | K. Punitha |
| | | Modern Periodic Table: Cause operiodicity; Features of the periodic table; classification of elements Periodic trends for atomic size- Atomic radii, Ionic, crystal | I BSc Che | 8 | Chalk and Talk, PPT, group discussion | K. Punitha |

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| | | and Covalent radii; ionization energy, electron affinity, electronegativity-electronegativity scales, applications of electronegativity. Problems involving the core concepts. | | | | |
| Sep | III | Unit -III Structure and Bonding - I : Ionic bond - Lewis dot structure of ionic compounds; properties of ionic compounds; Energy involved in ionic compounds; Born Haber cycle - lattice energies, Madelung constant; relative effect of lattice energy and solvation energy; Ion polarisation - polarising power and polarizability; Fajans' rules - effects of polarisation on properties of compounds; problems involving the core concepts. | | 8 | Chalk and Talk, PPT | K. Punitha |
| | | Covalent bond - Shapes of orbitals, overlap of orbitals - σ and π bonds; directed valency hybridization; VSEPR theory - shapes of molecules of the type AB_2 , AB_3 , AB_4 , AB_5 , AB_6 and AB_7 Partial ionic character of covalent bond-dipole moment, application to molecules of the type A_2 , AB , AB_2 , AB_3 , AB_4 ; percentage ionic character-numerical problems based on calculation of percentage ionic character. | I BSc Che | 7 | Chalk and Talk, PPT, | K. Punitha |
| Oct | IV | Unit -IV Structure and Bonding - II : VB theory - application to hydrogen molecule; concept of resonance - resonance structures of some inorganic species - CO_2 , NO_2 , CO_3^{2-} , NO_3^- ; limitations of VBT; MO theory - bonding, antibonding and nonbonding orbitals, bond order; | I BSc Che | 5 | Chalk and Talk, PPT and Seminar | K. Punitha |
| | | MO diagrams of H_2 , C_2 , O_2 , O_2^+ , O_2^- , O_2^{2-} , N_2 , NO , HF , CO ; magnetic characteristics, comparison of VB and MO theories. Coordinate bond: Definition, Formation of BF_3 , NH_3 , NH_4^+ , H_3O^+ properties Metallic bond-electron sea model, VB model; Band theory-mechanism of conduction in solids; conductors, insulator, semiconductor - types, applications of semiconductors. Weak Chemical Forces - Vander Waals forces, | I BSc Che | 5 | Chalk and Talk, PPT and Virtual Lab. | K. Punitha |
| | | ion-dipole forces, dipole-dipole interactions, induced dipole interactions, Instantaneous dipole-induced dipole | I BSc Che | 5 | Chalk and Talk, PPT and | |

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| | | interactions. Repulsive forces; Hydrogen bonding – Types, special properties of water, ice, stability of DNA; Effects of chemical force, melting and boiling points. | | | Virtual Lab | K. P. Pritha |
| Nov | V | Unit –V Basic concepts in Organic Chemistry and Electronic Effects: Types of bond cleavage – heterolytic and homolytic; arrow pushing in organic reactions; reagents and substrates; types of reagents - electrophiles, nucleophiles, free radicals; reaction intermediates – carbanions, carbocations, carbenes, arynes and nitrynes. Inductive effect - reactivity of alkyl halides, acidity of halo acids, basicity of amines; inductomeric and electromeric effects. | I BSc Che | 5 | Chalk and Talk, PPT | Dr. S. Mani Mekalur |
| | | Resonance – resonance energy, conditions for resonance - acidity of phenols, basicity of aromatic amines, stability of carbonium ions, carbanions and free radicals, reactivity of vinyl chloride, dipole moment of vinyl chloride and nitrobenzene, bond lengths; steric inhibition to resonance. Hyperconjugation - stability of alkenes, bond length, orienting effect of methyl group, dipole moment of aldehydes and nitromethane. Types of organic reactions- addition, substitution, elimination and rearrangements | I BSc Che | 8 | Chalk and Talk, PPT | Dr. S. Mani Mekalur |



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LESSON PLAN
2023-2024

Class : I BSc Chemistry
Sem : I
Course . Code : 23OUCHFC1
Title of the Paper : Role of Chemistry in Daily Life
Total Hours : 30hrs

| Month | Unit | Description of the Syllabus | Class | Hours Allocated | Teaching Mode & Methods | Course Teacher Signature |
|-------|------|---|-------------|-----------------|---------------------------------|--------------------------|
| July | I | General survey of chemicals used in everyday life. Air - components and their importance; photosynthetic reaction, air pollution, green - house effect and the impact on our life style. Water - | IBSc Che | 3 | Chalk and Talk, PPT | V.GOKILAA |
| | | Sources of water, qualities of potable water, soft and hard water, methods of removal of hardness-water pollution. | IBSc Che | 3 | Chalk and Talk, PPT | V.GOKILAA |
| Aug | II | Building materials - cement, ceramics, glass and refractories - definition, composition and application only. Plastics - polythene, PVC, bakelite, polyesters, melamine-formaldehyde resins -preparation and uses only. | IBSc Che | 6 | Chalk and Talk, PPT | J.ILAKKIYA PAVITHRA |
| Sep | III | Food and Nutrition - Carbohydrates, Proteins, Fats - definition and their importance as food constituents – balanced diet – Calories minerals and vitamins (sources and their | | 3 | Chalk and Talk, PPT | V.GOKILAA |
| | | physiological importance). Cosmetics – tooth paste, face powder, soaps and detergents, shampoos, nail polish, perfumes - general formulation and preparations - possible hazards of cosmetic use. | IBSc Che | 3 | Chalk and Talk, PPT, | V.GOKILAA |
| Oct | IV | Chemicals in food production – fertilizers - need, natural sources; urea, NPK fertilizers and super phosphate. Fuel – classification - solid, liquid and gaseous; nuclear fuel examples and uses. | IBSc Che | 6 | Chalk and Talk, PPT and Seminar | J.ILAKKIYA PAVITHRA |
| Nov | V | Pharmaceutical drugs - analgesics and antipyretics - paracetamol and aspirin. Colour chemicals - | IBSc Che | 3 | Chalk and Talk, PPT | V.GOKILAA |
| | | pigments and dyes - examples and applications. Explosives - classification and examples. | IBSc Che | 3 | Chalk and Talk, PPT | J.ILAKKIYA PAVITHRA |

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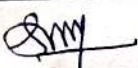


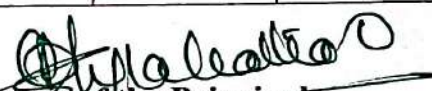
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LESSON PLAN
2023-2024

Class : I BSc Chemistry
Sem : I
Course. Code : 23OUCHSECN1
Title of the Paper : Food Chemistry
Total Hours : 30 hrs

| Month | Unit | Description of the Syllabus | Class | Hours Allocated | Teaching Mode & Methods | Course Teacher Signature |
|-------|------|--|-----------|-----------------|---------------------------------------|--------------------------|
| July | I | Food Adulteration: Sources of food, types, advantages and disadvantages. Food adulteration - contamination of wheat, rice, milk, butter etc. with clay stones, water and toxic chemicals -Common adulterants, Ghee adulterants and their detection. Detection of adulterated foods by simple analytical techniques. | I BSc Che | 6 | Chalk and Talk, PPT | K. PUNITHA |
| Aug | II | Food Poison -Food poisons - natural poisons (alkaloids - nephrotoxin) - pesticides, (DDT,BHC, Malathion) - Chemical poisons - First aid for poison consumed victims | I BSc Che | 6 | Chalk and Talk, PPT, group discussion | K. PUNITHA |
| Sep | III | Food Additives- Food additives -artificial sweeteners – Saccharin - Cyclamate and Aspartate Food flavours -esters, aldehydes and heterocyclic compounds – Food colours – Emulsifying agents – preservatives - leavening agents. Baking powder – yeast – tastemakers – MSG - vinegar. | | 6 | Chalk and Talk, PPT | K. PUNITHA |
| Oct | IV | Beverages Beverages-softdrinks-soda-fruitjuices-alcoholicbeverages-examples. Carbonation-addictionto alcohol– diseases ofliver andsocial problems. | I BSc Che | 6 | Chalk and Talk, PPT and Virtual Lab. | K. PUNITHA |
| Nov | V | Edible Oils: Fats and oils - Sources of oils - production of refined vegetable oils - preservation.Saturated and unsaturated fats - iodine value - role of MUFA and PUFA in preventing heartdiseases-determination of iodine value,RM value,saponification values and their significance | I BSc Che | 6 | Chalk and Talk, PPT | K. PUNITHA |


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LESSON PLAN
2023-2024

Class : I BSc N&D
 Sem : I
 Sub. Code : 23OUNDGECH1
 Title of the Paper : Chemistry for Biological Sciences
 Total Hours : 60hrs

| Month | Unit | Description of the Syllabus | Class | Hours Allocated | Teaching Mode & Methods | Course Teacher Signature |
|-------|------|--|-----------|-----------------|---------------------------------------|--------------------------|
| July | I | Chemical Bonding and Nuclear Chemistry Chemical Bonding: Molecular Orbital Theory-bonding, antibonding and non-bonding orbitals. M.O diagrams for Hydrogen, Helium, Nitrogen; discussion of bond order and magnetic properties. | I BSc N&D | 5 | Chalk and Talk, PPT | K. Punitha |
| | | Nuclear Chemistry: Fundamental particles - Isotopes, Isobars, Isotones and Isomers- Differences between chemical reactions and nuclear reactions- group displacement law. Nuclear binding energy - mass defect - calculations. Nuclear fission and nuclear fusion - differences - Stellar energy. Applications of radioisotopes - carbon dating, rock dating and medicinal applications. | I BSc N&D | 7 | Chalk and Talk, PPT | J. Lakshya Pavithra |
| Aug | II | Fuels: Fuel gases: Natural gas, water gas, semi water gas, carbureted water gas, producer gas, CNG, LPG and oil gas (manufacturing details not required). Silicones: Synthesis, properties and uses of silicones. | I BSc N&D | 7 | Chalk and Talk, PPT | K. Punitha |
| | | Fertilizers: Urea, ammonium sulphate, potassium nitrate NPK fertilizer, superphosphate, triple superphosphate | I BSc N&D | 5 | Chalk and Talk, PPT, group discussion | K. Punitha |
| Sep | III | Fundamental Concepts in Organic Chemistry Hybridization: Orbital overlap hybridization and geometry of CH ₄ , C ₂ H ₄ , C ₂ H ₂ and C ₆ H ₆ . Polar | I BSc N&D | 6 | Chalk and Talk, PPT | K. Punitha |

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| | | effects: Inductive effect and consequences on K_a and K_b of organic acids and bases, electromeric, mesomeric, hyper conjugation and steric-examples and explanation. | | | | J. Jakkriya Pavithra |
| | | Reaction mechanisms: Types of reactions- aromaticity-aromatic electrophilic substitution; nitration, halogenation, Friedel-Craft's alkylation and acylation. Heterocyclic compounds: Preparation, properties of pyrrole and pyridine. | I BSc N&D | 6 | Chalk and Talk, PPT, | J. Jakkriya Pavithra |
| Oct | IV | Drugs and Speciality Chemicals Definition, structure and uses: Antibiotics viz., Penicillin, Chloramphenicol and Streptomycin; Anaesthetics viz., Chloroform and ether | I BSc N&D | 5 | Chalk and Talk, PPT and Seminar | J. Jakkriya Pavithra |
| | | Antipyretics viz., aspirin, paracetamol and ibuprofen; Artificial Sweeteners viz., saccharin, Aspartame and cyclamate; Organic Halogen compounds viz., Freon, Teflon | I BSc N&D | 7 | Chalk and Talk, PPT and Virtual Lab. | J. Jakkriya Pavithra |
| Nov | V | Analytical Chemistry Introduction qualitative and quantitative analysis. Principles of volumetric analysis. Separation and purification techniques: extraction, distillation and crystallization. | I BSc N&D | 7 | Chalk and Talk, PPT | K. Punitha |
| | | Chromatography: principle and application of column, paper and thin layer chromatography. | I BSc N&D | 5 | Chalk and Talk, PPT | K. Punitha |


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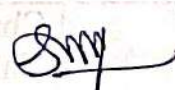
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LESSON PLAN
 2023-2024

Class : II BSc Chemistry
Sem : III
Course . Code : 22OUCH31
Title of the Paper : General Chemistry -III
Total Hours : 60hrs

| Month | Unit | Description of the Syllabus | Class | Hours Allocated | Teaching Mode & Methods | Course Teacher Signature |
|-------|------|--|---------------|-----------------|---------------------------------------|--------------------------|
| July | I | Alkyl halides: Preparation –general properties – nucleophilic substitution reactions –mechanisms of nucleophilic substitution reactions-SN ₂ and SN ₁ reactions with energy profile diagrams - mechanisms of elimination reactions. | II BSc Che | 4 | Chalk and Talk, PPT | V. Gokita |
| | | Fluorocarbons: Westron and Freon - elementary idea -fluorocarbons impact on environment. b) Aryl halides: Preparation by halogenation, Sandmayer and Hunsdiecker reactions – general properties | II BSc Che | 4 | Chalk and Talk, PPT | V. Gokita |
| | | Aralkyl halides: Benzyl chloride – preparations and properties – comparison between aryl halide and aralkyl halide. Synthesis and uses of DDT and BHC | II BSc Che | 4 | Chalk and Talk, PPT | V. Gokita |
| Aug | II | Position of hydrogen in the periodic table, General characteristics of s – block elements – Compounds of s-block metals – preparation and properties of Lithium oxide and sodium oxide, sodium hydroxide, sodium peroxide | II BSc Che | 5 | Chalk and Talk, PPT | Dr. S. Manimekala |
| | | carbonates – bicarbonates – nitrates – halides-anomalous behavior of Li and Be – extraction of beryllium – physical and chemical properties of Be – Uses – Extraction of Mg – physical and chemical properties – Uses. Complexes of s-block metals – complexes with crown ethers – biological importance sodium and potassium – Organometallic compounds of Li | II BSc Che | 7 | Chalk and Talk, PPT, group discussion | Dr. S. Manimekala |
| Sep | III | General characteristics of elements of Group III A – Extraction of Boron - Physical and chemical properties of Boron – compounds of boron – Borax, Diborane, Boron nitride – Extraction of Al – Physical and Chemical properties - uses – compounds of aluminium(Al ₂ O ₃ , alums) – Alloys of aluminium. | II BSc Che | 7 | Chalk and Talk, PPT | Dr. S. Manimekala |

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| | | General characteristics of elements of Group IV A – Allotropic forms of carbon – Diamond and Graphite-Chemistry of charcoal – chemistry of oxides of carbon (CO ₂)-preparation of Silicon – Physical and chemical properties of Si – Uses – preparation and properties of silicon dioxide – structures of silicates. Chemistry of silicones – Manufacture of glass – types of glasses | II BSc Che | 5 | Chalk and Talk, PPT, | Dr. S. Mani Mekalan |
| Oct | IV | General characteristics of elements of V A Group – Manufacture of nitrogen by Linde's process – Physical and chemical properties of nitrogen – uses – Chemistry of some compounds of nitrogen – hydrazine, hydrozoic acid-manufacture of nitric acid by Birkland and Eyde process –properties-uses-structure-nitrogen cycle | II BSc Che | 6 | Chalk and Talk, PPT and Seminar | V. Moklan |
| | | Preparation of phosphorus by old process – Physical and chemical properties of white phosphorus – uses of phosphorus – chemistry of PH ₃ , PCl ₅ and H ₃ PO ₄ – Oxides of Phosphorous (P ₄ O ₁₀). | II BSc Che | 3 | Chalk and Talk, PPT and Virtual Lab. | V. Moklan |
| | | oxides of oxygen (peroxides, basic oxides, amphoteric oxides, acidic oxides, neutral oxides) – Oxides of Sulphur (sulphur dioxide)–preparation, properties, uses and structure of H ₂ SO ₄ . | I BSc Che | 3 | Chalk and Talk, PPT and Virtual Lab | V. Moklan |
| Nov | V | Colloids - Distinguishing characteristics of colloids, suspensions and solutions- Types of colloidal dispersions-Optical properties- Tyndall effect– Kinetic properties – Brownian motion-Electrical properties– Helmholtz and diffuse double layers – electro kinetic property – electrophoresis and its applications. | I BSc Che | 6 | Chalk and Talk, PPT | K. Punitha |
| | | Coagulation – methods of coagulation – Hardy Schultz law – Hofmeister series - Protective colloids – protective action – gold number – applications- Emulsions – classification, preparation, Gels – preparation – properties (thixotropy and syneresis). | I BSc Che | 6 | Chalk and Talk, PPT | K. Punitha |


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LESSON PLAN
 2023-2024

Class : II BSc N&D
Sem : III
Sub. Code : 22OUNDGECH3
Title of the Paper : Bio Chemistry
Total Hours : 60hrs

| Month | Unit | Description of the Syllabus | Class | Hours Allocated | Teaching Mode & Methods | Course Teacher Signature |
|-------|------|--|------------|-----------------|---------------------------------------|--------------------------|
| July | I | a) Amino acids: Definition- classification- synthesis of α - amino acid (Gabriel synthesis, Koop synthesis and Strecker synthesis) | II BSc N&D | 3 | Chalk and Talk, PPT | Dr. A. RAMYA |
| | | Properties of amino acids (isoelectric point, decarboxylation, acylation, action of heat, peptide formation). b) Proteins: Definition- classification (simple and conjugated proteins)- structure of proteins (primary, secondary, tertiary and quaternary)- | II BSc N&D | 6 | Chalk and Talk, PPT | Dr. A. RAMYA |
| | | Properties of proteins (Dipolar or Zwitter ions, colloidal nature, isoelectric point, denaturation, hydrolysis)- color tests for proteins (Biuret test, Ninhydrin test). | II BSc N&D | 3 | Chalk and Talk, PPT | Dr. A. RAMYA |
| Aug | II | Vitamins: Definition- classification- source- function and deficiency disease of vitamins A, B complex, C, D, E and K. | II BSc N&D | 5 | Chalk and Talk, PPT | J. LAKSHYA PAVITHRA |
| | | Hormones: Definition- classification- main functions of following hormones- Adrenaline, Cortisone, Testosterone, Estrone, Insulin, | II BSc N&D | 7 | Chalk and Talk, PPT, group discussion | J. LAKSHYA PAVITHRA |

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| | | pituitary hormones, and thyroxin- differences between hormones and vitamins. | | | | |
| Sep | III | Definition-Classification of nucleic acid- nucleosides- nucleotides- function of nucleotides- nucleotide as energy carriers | II BSc N&D | 6 | Chalk and Talk, PPT | Dr. A. Ramya |
| | | stStructure of DNA- replication of DNA- functions of DNA- structure and functions of RNA- difference between DNA and RNA. | II BSc N&D | 6 | Chalk and Talk, PPT, | Dr. A. Ramya |
| Oct | IV | Definition -properties- classification-Co factors and coenzyme | II BSc N&D | 4 | Chalk and Talk, PPT and Seminar | J. I LAKKIYA PAVITHRA |
| | | Mechanism of enzyme action- factors influencing enzyme activity- enzyme action-enzyme inhibition (competitive inhibitor, non-competitive inhibitor and end product inhibition)- role of enzymes in the digestion of food. | II BSc N&D | 8 | Chalk and Talk, PPT and Virtual Lab. | J. I LAKKIYA PAVITHRA |
| Nov | V | Introduction- classification- composition of fats - extraction and refining of fats- | II BSc N&D | 5 | Chalk and Talk, PPT | Dr. A. Ramya |
| | | Properties (saponification, hydrogenation, rancidity) - analysis of fats (saponification value, acid value, iodine value, Reichert-Meisel value) - uses of fats. | II BSc N&D | 7 | Chalk and Talk, PPT | Dr. A. Ramya |


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LESSON PLAN
 2023-2024

Class : II BSc Physics
 Sem : III
 Course. Code : 22OUPHGECH3
 Title of the Paper : Physical Chemistry
 Total Hours : 60hrs

| Month | Unit | Description of the Syllabus | Class | Hours Allocated | Teaching Mode & Methods | Course Teacher Signature |
|-------|------|---|------------|-----------------|---------------------------------------|--------------------------|
| July | I | a) Ideal gases: Kinetic theory of ideal gases - gas laws - ideal gas equation -Definition of most probable velocity | II BSc Phy | 4 | Chalk and Talk, PPT | K.PUNITHA |
| | | Mean velocity - RMS velocity - Collision diameter -collision cross section - collision -frequency -Mean free path | II BSc Phy | 4 | Chalk and Talk, PPT | K.PUNITHA |
| | | b) Real gases: Deviation from ideal behavior - Derivation of vanderwaal's equation - Methods of liquefaction of gases - Joule Thomson effect - Inversion temperature. | II BSc Phy | 4 | Chalk and Talk, PPT | J.ILAKKIYA PAVITHRA |
| Aug | II | Introduction to solids – Crystalline and amorphous. Unit cell, Bravais lattices -X-ray diffraction by crystals , Bragg's equation -derivation. Ionic Crystals Analysis of sodium chloride, potassium chloride | II BSc Phy | 7 | Chalk and Talk, PPT. | J.ILAKKIYA PAVITHRA |
| | | Powder and single crystal methods. Radius ratio rules – coordination number. Packing arrangement – different structure types in solids – rock salts, zinc blende, wurtzite. | II BSc Phy | 5 | Chalk and Talk, PPT, group discussion | J.ILAKKIYA PAVITHRA |
| Sep | III | Definition-difference between adsorption and absorption adsorbate, adsorbent-physical adsorption-chemical adsorption-differences between these two types-factors influencing adsorption-adsorption isotherm-Langmuir isotherm (no derivation, statement only) adsorption of gases on solid surface. | II BSc Phy | 6 | Chalk and Talk, PPT | K.PUNITHA |
| | | Catalysis: Definition-different types of catalysis-acid base catalysis-surface catalytic reactions-definition and examples-auto-catalyst -catalytic poisoning-promoters-enzyme catalysis-characteristics | II BSc Phy | 6 | Chalk and Talk, PPT, | K.PUNITHA |

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| Oct | IV | Chemical kinetics:Rate of the reaction- rate law- rate constant- order and molecularity of reaction- differences between order and molecularity | II BSc Phy | 6 | Chalk and Talk, PPT and Seminar | J. ILAKKIYA PAVITHRA |
| | | Derivation of rate constant and half life period for first order-examples for second order, third order reaction. Effect of temperature on reaction rate (Arrhenius theory of reaction rate) | II BSc Phy | 6 | Chalk and Talk, PPT and Virtual Lab. | J. ILAKKIYA PAVITHRA |
| Nov | V | Definition of photochemical reaction-differences between thermal and photochemical reactions-laws of photochemistry [Lambert, Beer's law and Stark-Einstein's law]-quantum yield | II BSc Phy | 4 | Chalk and Talk, PPT and Virtual Lab | K. PUNITHA |
| | | Explanation of low and high quantum yield-experimental determination of quantum yield.ii) Jablonski diagram, Non-radiative transition(IC and ISC) and radioactive transition (Fluorescence and Phosphorescence) | II BSc Phy | 4 | Chalk and Talk, PPT | K. PUNITHA |
| | | Differences between fluorescence and phosphorescence. iii) Photosensitization - chemiluminescence and bioluminescence | II BSc Phy | 4 | Chalk and Talk, PPT | K. PUNITHA |



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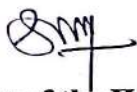
LESSON PLAN
 2023-2024

Class : III BSc Chemistry
 Sem : V
 Sub. Code : 21K51
 Title of the Paper : Organic Chemistry
 Total Hours : 60hrs

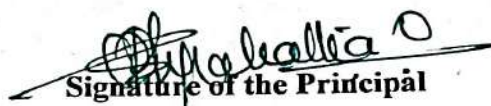
| Month | Unit | Description of the Syllabus | Class | Hours Allocated | Teaching Mode & Methods | Course Teacher Signature |
|-------|------|--|-------------|-----------------|---------------------------------------|--------------------------|
| July | I | UNIT: I AROMATIC SUBSTITUTION: Isomerism and orientation of benzene derivatives-determination of orientation-rules of orientation- | III BSc Che | 4 | Chalk and Talk, PPT | Dr. S. MANI MEKALAI |
| | | electronic interpretation of directive effects-mechanism of aromatic electrophilic substitution – halogenation, nitration and sulphonation, Friedel –Craft's reaction (alkylation, acylation) -influence of substituents – | III BSc Che | 4 | Chalk and Talk, PPT | Dr. S. MANI MEKALAI |
| | | activating and deactivating groups-aromatic nucleophilic substitution-unimolecular, bimolecular substitution and benzyne mechanism. | III BSc Che | 4 | Chalk and Talk, PPT | Dr. S. MANI MEKALAI |
| Aug | II | UNIT: II AROMATIC ALDEHYDES, KETONES AND CARBOXYLIC ACIDS: a) Preparation and properties of benzaldehyde, and acetophenone-Organic naming reactions: Reimer-Tiemann reaction, benzoin condensation, claisen condensation, knoevenagel reaction, cannizzaro reaction, | III BSc Che | 5 | Chalk and Talk, PPT | Dr. A. RAMYA |
| | | crossed cannizzaro reaction, claisen-Schmidt reaction, perkin reaction - α , β - Unsaturated carbonyl compounds: Preparation and properties of cinnamaldehyde. b) Carboxylic acids: | III BSc Che | 7 | Chalk and Talk, PPT, group discussion | Dr. A. RAMYA |

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| | | Preparation and properties of benzoic, salicylic, anthranilic and o-phthalic acids. | | | | |
| Sep | III | UNIT: III ORGANIC NITROGEN COMPOUNDS: a) Aromatic amines: Introduction- classification-methods of preparation of primary amines- reduction of nitro compounds and ammonolysis of aryl halides -methods of preparation of secondary and tertiary amines from aniline, acetanilide-properties: basicity of amines, salt formation, acylation, alkylation and arylation, carbylamine reaction, reaction with aldehyde, CS ₂ , Grignard reagent, bromination, nitration and sulphonation. Distinguish between primary, secondary and tertiary amines. | III BSc Che | 6 | Chalk and Talk, PPT | Dr.S.MANI MEKALAI |
| | | b) Aromatic nitro compounds: nomenclature, preparation-nitration, from diazonium salts, reactions- reduction of nitrobenzene in different medium, electrophilic substitution reactions. c) Cyanides & Isocyanides: Preparation, properties of alkyl cyanides & alkyl isocyanides. Differences between alkyl cyanides & alkyl isocyanides. | III BSc Che | 6 | Chalk and Talk, PPT, | Dr.S.MANI MEKALAI |
| Oct | IV | UNIT: IV HETEROCYCLIC COMPOUNDS: Nomenclature and classification, general characteristics-aromatic character and reactivity- | III BSc Che | 3 | Chalk and Talk, PPT and Seminar | Dr.S.MANI MEKALAI |
| | | Preparation and reactions of pyrrole, furan, thiophene, pyridine, | III BSc Che | 5 | Chalk and Talk, PPT and Virtual Lab. | Dr.A. Ramya |
| | | quinolone, isoquinoline and indole. | III BSc Che | 4 | Chalk and Talk, PPT and Virtual Lab | Dr.A. Ramya |
| Nov | V | UNIT: V CARBOHYDRATES: Definition and classification- determination of configuration (Fischer's proof) -glucose, fructose-occurrence, preparation, | III BSc Che | 6 | Chalk and Talk, PPT | Dr.A. Ramya |

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| | properties, reactions, structural elucidation and uses-mutarotation- | | | | |
| | epimerisation- methods of ascending and descending in the sugar series- interconversion between glucose and fructose-disaccharides-sucrose-preparation, properties and structural elucidation-comparison between glucose, fructose and sucrose. | III BSc Che | 6 | Chalk and Talk, PPT | Dr. A. Ramya |



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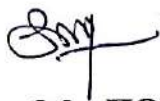
LESSON PLAN
2023-2024

Class : III BSc Chemistry
Sem : V
Sub. Code : 21K52
Title of the Paper : Physical Chemistry
Total Hours : 60hrs

| Month | Unit | Description of the Syllabus | Class | Hours Allocated | Teaching Mode & Methods | Course Teacher Signature |
|-------|------|--|-------------|-----------------|-------------------------|--------------------------|
| July | I | UNIT: I THERMODYNAMICS-I: a) Importance of thermodynamics-concepts of a system, surroundings, energy-state variables-extensive intensive properties-different types of processes-isothermal, adiabatic, isobaric, isochoric, reversible, irreversible processes and cyclic. | III BSc Che | 4 | Chalk and Talk, PPT | Dr. A. Ramya |
| | | First law of thermodynamics-concept and significance of heat(q), work(w), internal energy(E), enthalpy(H)- heat capacity at constant P and V- Relation between C _p and C _v -work done in reversible isothermal expansion and compression –maximum work- work done in irreversible isothermal expansion and adiabatic expansion. | III BSc Che | 4 | Chalk and Talk, PPT | Dr. A. Ramya |
| | | The Joule-Thomson effect, Joule Thomson coefficient for real and ideal gas. b) Zeroth law of thermodynamics-absolute temperature scale. | III BSc Che | 4 | Chalk and Talk, PPT | Dr. A. Ramya |
| Aug | II | UNIT: II THERMODYNAMICS-II: a) Second law of thermodynamics: limitations of first law, spontaneity and randomness-Carnot cycle-Carnot's theorem-entropy as a thermodynamic property-Clausius inequality-calculation of entropy change of an ideal gas with change in P,V and T – Entropy changes of an ideal gas in different process –Physical significance of entropy – Work and free energy functions | III BSc Che | 5 | Chalk and Talk, PPT | V. GOKILAA |

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| | | <p>- Variation of free energy change with temperature & pressure - Maxwell's relationships - The Gibbs- Helmholtz equation- The Clapeyron- Clausis equation and its applications. Van't Hoff isotherm- Van't Hoff isochore.b) Third law of thermodynamics: Nernst heat theorem - Statement of Third law of Thermodynamics, determination of absolute entropy of solid, liquid and gas.</p> | III BSc Che | 7 | Chalk and Talk, PPT, group discussion | V.GOKILAA |
| Sep | III | <p>UNIT: III PHASE RULE AND SOLUTIONS: a) Statement and significance of the terms involved. Derivation of phase rule from thermodynamic derivation-application of phase rule to one-component system (water, sulphur system only). b) Two component systems-simple eutectic system (lead-silver system only)-compound formation-congruent melting point (Mg-Zn system only),</p> | III BSc Che | 6 | Chalk and Talk, PPT | DRA.RAMYA |
| | | <p>salt hydrates (FeCl₃-H₂O system only)- incongruent melting point (KI-H₂O system only). c) Thermodynamics of ideal solutions-Henry's law, Raoult's law-binary liquid-system-partially miscible (phenol-water system)-effect of impurities on critical solution temperature- completely miscible and completely immiscible system-theory of fractional distillation and steam distillation.</p> | III BSc Che | 6 | Chalk and Talk, PPT, | V.GOKILAA |
| Oct | IV | <p>UNIT: IV COLLIGATIVE PROPERTIES: Colligative properties - lowering of vapour pressure -</p> | III BSc Che | 3 | Chalk and Talk, PPT and Seminar | V.GOKILAA |
| | | <p>osmosis and osmotic pressure -elevation of boiling point -depression in freezing point - experimental determination of lowering of vapour pressure and osmotic pressure</p> | II BSc Che | 6 | Chalk and Talk, PPT and Virtual Lab. | V.GOKILAA |
| | | <p>- Van't Hoff factor - degree of association - degree of dissociation.</p> | I BSc Che | 3 | Chalk and Talk, PPT and | V.GOKILAA |

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| | | | | | Virtual Lab | |
| Nov | V | UNIT: V GROUP THEORY: Introduction-symmetry elements and symmetry operations- rules of a group, order of a group - classes and similarity transformation- point group classification ($C_1, C_2, C_3, C_{nv}, D_{nh}, T_d, O_h$) - matrix representation of symmetry operation- rotation & reflection- | I BSc Che | 8 | Chalk and Talk, PPT | V.GOKILAA |
| | | reducible and irreducible representation (definition only)- Orthogonality theorem - construction of character table (C_{2v} only). | I BSc Che | 4 | Chalk and Talk, PPT | V.GOKILAA |



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LESSON PLAN
2023-2024

Class : III BSc Chemistry
Sem : V
Sub. Code : 21KE5A
Title of the Paper : Inorganic and Analytical Chemistry
Total Hours : 60hrs

| Month | Unit | Description of the Syllabus | Class | Hours Allocated | Teaching Mode & Methods | Course Teacher Signature |
|-------|------|--|-------------|-----------------|---------------------------------------|--------------------------|
| July | I | UNIT: I HALOGEN COMPOUNDS: a) Halogen compounds: Electronic configuration, diatomic nature, oxidizing property, electronegativity and electron affinity – Difficulties in the discovery and isolation of fluorine | III BSc Che | 4 | Chalk and Talk, PPT | Dr. S. MANI MEKALAI |
| | | – peculiarities of fluorine – electropositive character of Iodine b) Interhalogen Compounds: Interhalogen compounds: preparation, properties of ClF, ICl, ClF ₃ , ClF ₅ , BrF ₅ , IF ₅ , IF ₇ – | III BSc Che | 5 | Chalk and Talk, PPT | Dr. S. MANI MEKALAI |
| | | structure of ICl, ClF ₃ , IF ₅ , IF ₇ - poly halides and pseudo halogens. | III BSc Che | 3 | Chalk and Talk, PPT | Dr. S. MANI MEKALAI |
| Aug | II | UNIT: II TRANSITION ELEMENTS: a) Transition elements – position in the periodic table – general characteristics of d-block elements. b) Occurrence, extraction, properties and uses of titanium, molybdenum and tungsten. c) Chemistry of titanium dioxide, titanium tetrachloride, vanadium pentoxide-ammonium vanadate, ammonium molybdate, molybdenum blue, tungsten oxide and tungsten bronze | III BSc Che | 5 | Chalk and Talk, PPT | Dr. A. RAMYA |
| | | | III BSc Che | 7 | Chalk and Talk, PPT, group discussion | Dr. A. RAMYA |
| Sep | III | UNIT: III LANTHANIDES AND ACTINIDES: General characteristics of lanthanides and actinides. Lanthanide and actinides, separation by ion-exchange and solvent extraction methods – lanthanide contraction-actinide contraction | III BSc Che | 6 | Chalk and Talk, PPT | Dr. S. MANI MEKALAI |
| | | Isolation of thorium from monazite – preparation, properties and uses of ceric ammonium sulphate, thorium dioxide and | III BSc Che | 6 | Chalk and Talk, PPT, | Dr. S. MANI MEKALAI |

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| | | uranyl acetate. Applications of lanthanides and actinides. | | | | |
| Oct | IV | UNIT: IV NON-AQUEOUS SOLVENTS & INORGANIC POLYMERS a) Non-aqueous solvents: Classification of solvents-general properties of ionizing solvents-chemical reactions- | III BSc Che | 2 | Chalk and Talk, PPT and Seminar | Dr. A. Ramya |
| | | liquid ammonia as solvents-liquid sulphur dioxide as solvents-liquid hydrogen fluoride as solvents. b) Inorganic polymers: Introduction-general properties of inorganic polymers -silicon based polymers- | III BSc Che | 5 | Chalk and Talk, PPT and Virtual Lab. | Dr. A. Ramya |
| | | polysiloxane gums and silicon rubber-industrial applications of inorganic polymer. | III BSc Che | 4 | Chalk and Talk, PPT and Virtual Lab | Dr. A. Ramya |
| Nov | V | UNIT: V DATA ANALYSIS AND THERMOANALYTICAL METHODS: a) Data analysis: Introduction-mean – median-precision-accuracy-confidence limits- definition – determinate errors- indeterminate errors | III BSc Che | 4 | Chalk and Talk, PPT | Dr. A. Ramya |
| | | rules for types improving accuracy of data-significant figure-method of least squares. b) Thermoanalytical methods: Introduction-Thermogravimetric analysis (TGA) – principle –thermal analysis of silver nitrate-derivative thermogravimetry(DGA)-factors which influence the thermogram-application of thermogravimetry. | III BSc Che | 8 | Chalk and Talk, PPT | Dr. S. MANI MEKALA I |


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LESSON PLAN
2023-2024

Class : III BSc Chemistry
Sem : V
Sub. Code : 21SEK51
Title of the Paper : Chemistry of Bio Molecules
Total Hours : 30hrs

| Month | Unit | Description of the Syllabus | Class | Hours Allocated | Teaching Mode & Methods | Course Teacher Signature |
|-------|------|--|-------------|-----------------|---------------------------------------|--------------------------|
| July | I | UNIT: I AMINO ACIDS AND PROTEINS: a) Amino acids: Definition- classification- synthesis of α -amino acid (Gabriel synthesis, Koop synthesis and strecker synthesis)- properties of amino acids (isoelectric point, decarboxylation, acylation, action of heat, peptide formation). | III BSc Che | 4 | Chalk and Talk, PPT | Dr. A. Ramya |
| | | b) Proteins: Definition- classification (simple and conjugated proteins)- structure of proteins (primary, secondary, tertiary and quaternary)-properties of proteins (dipolar or zwitter ion, colloidal nature, isoelectric point, denaturation, hydrolysis)- colour tests for proteins (Biuret test, ninhydrin test). | III BSc Che | 6 | Chalk and Talk, PPT | Dr. A. Ramya |
| Aug | II | UNIT: II NUCLEIC ACIDS: Definition- classification of nucleic acid-structure of nucleic acid-nucleosides- | III BSc Che | 5 | Chalk and Talk, PPT | Dr. A. Ramya |
| | | nucleotides- function of nucleotides- structure of DNA- replication of DNA- functions of DNA-structure and functions of RNA difference between DNA and RNA. | III BSc Che | 5 | Chalk and Talk, PPT, group discussion | Dr. A. Ramya |
| Sep | III | UNIT: III VITAMINS AND HORMONES: a) Vitamins: Definition- classification- source- function and deficiency disease of vitamins A, B complex, C, D, E and K. | III BSc Che | 5 | Chalk and Talk, PPT | Dr. A. Ramya |

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| | | b) Hormones: Definition- classification- main functions of following hormones- Adrenaline, Cortisone, Testosterone, Estrone, Insulin, pituitary hormones, and thyroxin. Differences between hormones and vitamins. | III BSc Che | 5 | Chalk and Talk, PPT, | Dr.A. Ramya |
| Oct | IV | UNIT: IV ENZYMES: Definition - classification- cofactor & coenzyme- factors influencing enzyme activity- | III BSc Che | 4 | Chalk and Talk, PPT and Seminar | Dr.A. Ramya |
| | | enzyme action- mechanism of enzyme action- -enzyme inhibitors (competitive inhibitor, | III BSc Che | 4 | Chalk and Talk, PPT and Virtual Lab. | Dr.A. Ramya |
| | | non-competitive inhibitor)- applications of enzymes. | III BSc Che | 2 | Chalk and Talk, PPT and Virtual Lab | Dr.A. Ramya |
| Nov | V | UNIT : V OILS: Introduction- classification-composition of oils - occurrence & extraction of oils (extraction-refining)-properties (rancidity, saponification, hydrogenation) - | III BSc Che | 4 | Chalk and Talk, PPT | Dr.A. Ramya |
| | | analysis of oils and (acid value, saponification value, iodine value, Reichert-Meissel value) - uses of oils. | III BSc Che | 6 | Chalk and Talk, PPT | Dr.A. Ramya |



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LESSON PLAN
2023-2024

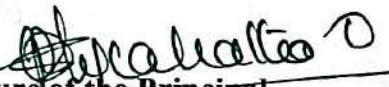
Class : III BSc N&D
Sem : V
Sub. Code : 21AKN5
Title of the Paper : General Chemistry-III
Total Hours : 60hrs

| Month | Unit | Description of the Syllabus | Class | Hours Allocated | Teaching Mode & Methods | Course Teacher Signature |
|-------|------|--|------------|-----------------|---------------------------------------|--------------------------|
| July | I | a) Valence Bond Theory-Postulates of VB Theory –Types of overlap of Atomic orbitals- s-s Overlapping -s- p Overlapping -p - p Overlapping | II BSc N&D | 4 | Chalk and Talk, PPT | K.Punitha |
| | | Types of Covalent bond -Sigma bond, pi bond and their differences. b) Molecular Orbital Theory -Formation of molecular orbital (combination of s - s Orbital only) - Differences between bonding and antibonding molecular orbitals | II BSc N&D | 5 | Chalk and Talk, PPT | K.Punitha |
| | | Molecular orbital diagram, Bond Order and Magnetic Properties for the following homo nuclear diatomic molecules –Hydrogen, Helium and Nitrogen. | II BSc N&D | 3 | Chalk and Talk, PPT | K.Punitha |
| Aug | II | a) Oxidation and Reduction-Electronic concept of Oxidation and Reduction-oxidation number-differences between oxidation number and valency- rules for calculating oxidation number-solved examples- concept of -oxidizing agents and reducing agents-redox reactions and half reactions. | II BSc N&D | 5 | Chalk and Talk, PPT | K.Punitha |
| | | b) Modern concepts of Acids and Bases-Arrhenius concept, Bronsted-Lowry concept, Lewis concept and Usanovich concept- relative strengths of acids and bases –amphoteric Solvents-Levelling effects. | II BSc N&D | 7 | Chalk and Talk, PPT, group discussion | K.Punitha |
| Sep | III | Aliphatic halogen compounds -Preparation, Properties and uses of Chloroform and Carbon Tetrachloride -Aromatic halogen compounds -Preparation, Properties and uses of Chlorobenzene | II BSc N&D | 7 | Chalk and Talk, PPT | J. Ilakkiya Pavithra |
| | | Mechanism of aliphatic nucleophilic substitution -SN ¹ – Explanation with Example -SN ² – Explanation with Example-Differences between SN ¹ and SN ² Mechanisms. | II BSc N&D | 5 | Chalk and Talk, PPT, | J. Ilakkiya Pavithra |
| Oct | IV | a) Polymers-Definition- Classification of Polymerisation Reactions-Addition-Polymerization-Condensation Polymerization. | II BSc N&D | 3 | Chalk and Talk, PPT | K.Punitha |

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| | | b) fibres-Definition-Manufacture and uses of important fibres -Polyamide fibre-Polyester fibre. c) Resins – Definition - Manufacture and uses of Amino resin, Unsaturated Polyester resin. | II BSc N&D | 5 | Chalk and Talk, PPT and Virtual Lab. | J. Lakshya Panthra |
| | | d) Plastics -Definition -Classification of Plastic -Thermoplastics -Thermosetting plastics- Manufacture and uses of Polythene and PolyVinyl Chloride. | II BSc N&D | 4 | Chalk and Talk, PPT and Virtual Lab | J. Lakshya Panthra |
| Nov | V | Ionic Product of Water -Hydrolysis – definition – Explain degree of Hydrolysis and Hydrolysis constant of the following-Salts of strong acid and strong base | II BSc N&D | 6 | Chalk and Talk, PPT | K. Punitha |
| | | Salts of weak acid and strong base- Salts of strong acid and weak base -Salts of weak acid and weak base. | II BSc N&D | 6 | Chalk and Talk, PPT | K. Punitha |



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LESSON PLAN
2023-2024

Class : III BSc Physics

Sem : V

Sub. Code : 21AKP5

Title of the Paper : Inorganic, physical and medicinal Chemistry


Total Hours : 60hrs

| Month | Unit | Description of the Syllabus | Class | Hours Allocated | Teaching Mode & Methods | Course Teacher Signature |
|-------|------|--|------------|-----------------|---------------------------------------|--------------------------|
| July | I | a) Long form of periodic table-classification of elements into s, p, d and f blocks. b) Atomic radii, ionic radii, ionization potential, electron affinity, electro negativity and their periodic variations. | II BSc Phy | 12 | Chalk and Talk, PPT | V.GOKILAA |
| Aug | II | Introduction-octet rule and its limitations-types of bonds-Covalent bond - Ionic bond -factors forming the formation of ionic bonds-- difference between covalent and ionic bonds - Fajans' rule - coordinate covalent bond - | II BSc Phy | 5 | Chalk and Talk, PPT | J.ILAKKIYA PAVITHRA |
| | | VSEPR theory - Valence bond theory-limitations of VBT - hybridisation - sp (BeCl ₂), sp ² (BCl ₃) and sp ³ (CH ₄). Molecular orbital theory: Bonding and antibonding molecular orbitals. MO diagram or molecules like H ₂ , He ₂ , O ₂ , N ₂ , CO. Comparison between VBT and MOT. | II BSc Phy | 7 | Chalk and Talk, PPT, group discussion | V.GOKILAA |
| Sep | III | Introduction: Phases of colloids-classification of colloidal solutions-preparation (Dispersion methods only). properties- colligative property- optical property-Tyndal effect, Kinetic property-Brownian movement; Electrical properties-Electrical double layer and, Electrophoresis- | II BSc Phy | 7 | Chalk and Talk, PPT | V.GOKILAA |
| | | Purification of colloidal solution -dialysis. Applications of colloids: Food, colloidal medicine, rubber plating, sewage disposal, clarification of water, detergent action of soap, artificial rain. | II BSc Phy | 5 | Chalk and Talk, PPT, | V.GOKILAA |
| Oct | IV | a. Catalysis- characteristics- - different types-homogeneous-heterogeneous-acid-base catalysis-auto catalysis-theories of catalysis-intermediate compound formation theory and adsorption theory- | II BSc Phy | 4 | Chalk and Talk, PPT and Seminar | J.ILAKKIYA PAVITHRA |
| | | kinetics of enzyme catalysis - Michaelis Menton equation. - applications of catalysis. | II BSc Phy | 3 | Chalk and Talk, PPT and Virtual Lab. | J.ILAKKIYA PAVITHRA |

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| | | b. Adsorption-definition-adsorbent-adsorbate-examples-difference between adsorption and absorption- factors influencing adsorption of gases on solid - physisorption and chemisorption- Langmuir adsorption isotherm -Applications of adsorption. | II BSc Phy | 5 | Chalk and Talk, PPT and Virtual Lab | N. GOKILAA |
| Nov | V | Chemotherapy: Introduction a) Anesthetics: Definition-classification with examples. b) Analgesics: | II BSc Phy | 4 | Chalk and Talk, PPT | V. GOKILAA |
| | | Definition- classification with examples. c) Antibiotics-Definition-uses of penicillin, streptomycin, tetracycline and chloramphenicol. d) Antimalarial Drugs- Definition- mode of action- examples. | II BSc Phy | 8 | Chalk and Talk, PPT | V. GOKILAA |



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