

I B.Sc., Paper – I, Ch. Udaya Bhaskar Rao, Ch Sujitha

| S. No | Month | Syllabus-Topic | Additional inputs Value Addition | Curricular activity | | | | Co-curricular activity | | | |
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| | | | | Activity | Hours allotted | Whether Conducted | If not alternate days | Activity | Hours allotted | Whether Conducted | If not alternate days |
| | Feb-21 | Chemistry of p-block elements : Group -13: Preparation and structure of Diborane and Borazine. Group -14: Preparation, classification and uses of silicones. Group-15: Preparation and structures of Phosphonitrilic halides $\{(PNCl_2)_n \text{ where } n=3,4\}$ Group -16: Oxides and Oxoacids of sulphur (structures only) Group -17: Structures of Inter halogen compounds and pseudo halogens. | Hydrazine and Hydroxylamine | Orientation course | | Conducted | | | | | |
| | Mar-21 | Chemistry of d-block elements : Characteristics of d-block elements with special reference to electronic configuration, variable valence, magnetic properties, catalytic properties and ability to form complexes. Stability of various oxidation states. Chemistry of f-block elements: Chemistry of lanthanides - electronic structure, oxidation states, lanthanide contraction, consequences of lanthanide contraction, magnetic properties. Chemistry of actinides - electronic configuration, oxidation states, actinide contraction, comparison of lanthanides and actinides. | | Assignment | | Conducted | | | | | |

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| | Apr-21 | Theories of bonding in metals: Valence bond theory, Free electron theory, Explanation of thermal and electrical conductivity of metals based on these theories, Band theory-formation of bands. | | Assignment | | Conducted | | Student seminars | | Conducted | |
| | May-21 | UNIT-I (Physical Chemistry) Solid state: Symmetry in crystals. Law of constancy of interfacial angles. The law of rationality of indices. The law of symmetry. Miller indices, Definition of lattice point, space lattice, unit cell. Derivation of Bragg's equation. Defects in crystals. Stoichiometric and non-stoichiometric defects. | | Assignment | | Conducted | | | | | |
| | Jun-21 | Gaseous state: Vander Waal's equation of state. Critical phenomena. Relationship between critical constants and vanderWaal's constants. Law of corresponding states. Joule Thomson effect. | | | | | | | | | |
| | | Liquid state: Liquid crystals, the mesomorphic state. Classification of liquid crystals into Smectic and Nematic. Differences between liquid crystal and solid/liquid. Application of liquid crystals as LCD devices. | | Assignment | | Conducted | | | | | |

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| | Jul-21 | Solutions: Liquid-liquid - ideal solutions, Raoult's law. Ideally dilute solutions, Henry's law. Azeotropes-HCl-H ₂ O, ethanol-water systems. Partially miscible liquids- phenol-water system. Effect of impurity on consolute temperature. Nernst distribution law. Applications of distribution law. Ionic equilibrium: Ionic product, common ion effect, solubility and solubility product. Calculations based on solubility product. Dilute solutions Colligative properties- Relative lowering of vapour pressure, Osmotic pressure, Elevation of boiling point and depression of freezing point. Experimental methods for determination of depression in freezing point and osmotic pressure, Abnormal Colligative properties | | Assignment | | Conducted | | Student seminars | | Conducted | |
| | Aug-21 | | | Mid Exams | | Conducted | | | | | |

I B.Sc., Paper – II, Name of the lecturer: Ch Sujitha

| S. No | Month | Syllabus-Topic | Additional inputs Value Addition | Curricular activity | | | | Co-curricular activity | | | |
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| | | | | Activity | Hours allotted | Whether Conducted | If not alternate days | Activity | Hours allotted | Whether Conducted | If not alternate days |
| | Sep-21 | . <u>UNIT-IV(Organic Chemistry)</u> Carbon-Carbon sigma bonds (Alkanes and Cycloalkanes) General methods of preparation of alkanes- Wurtz and Wurtz Fittig reaction, Corey House synthesis, physical and chemical properties of alkanes, Free radical substitutions(Halogenation). Conformational analysis of alkanes (Conformations, relative stability and energy diagrams of Ethane). General methods of preparation of cycloalkanes and relative stability, Baeyer strain theory. | | Assignment | | Conducted | | | | | |
| | | Carbon–Carbon pi Bonds (Alkenes and Alkynes) General methods of preparation, physical and chemical properties. Mechanism of E1,E2 reactions, Saytzeff and Hoffmann eliminations, Electrophilic additions, mechanism (Markownikoff /Anti markownikoff addition) with suitable examples, Syn and anti-addition-addition of H ₂ , X ₂ , HX. Oxymercuration – demercuration, hydroboration-oxidation, ozonolysis, hydroxylation, Diels alder reaction-1,2 and 1,4 addition reactions in conjugated dienes.Reactions of alkynes; acidity, electrophilic and nucleophilic additions, hydration to form carbonyl compounds. | | Assignment | | Conducted | | Student seminars | | Conducted | |
| | Oct-21 | Benzene and its reactivity Concept of aromaticity, Huckel's rule - application to Benzenoid)(Benzene, Naphthalene and NonBenzenoid compounds (cyclopropenylcation, cyclopentadienyl anion and tropyliumcation) Reactions - General mechanism of electrophilic aromatic substitution, mechanism of nitration, Friedel-Craft's alkylation and acylation. Orientation of aromatic substitution - ortho, para and meta directing groups. Ring activating and deactivating groups with examples | | Assignment | | Conducted | | | | | |

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| | Nov-21 | <p>(Electronic interpretation of various groups like NO₂ and Phenolic). Orientation of (i) Amino, methoxy and methyl groups (ii) Carboxy, nitro, nitrile, carbonyl and sulphonic acid groups (iii) Halogens (Explanation by taking minimum of one example from each type)</p> <p><u>UNIT-IV(General Chemistry)</u></p> <p>Surface chemistry Colloids - Coagulation of colloids- Hardy-Schulze rule. Stability of colloids, Protection of Colloids, Gold number. Adsorption - Physical and chemical adsorption, Langmuir adsorption isotherm, applications of adsorption</p> <p>Chemical Bonding Valence bond theory, hybridization, VB theory as applied to ClF₃, Ni(CO)₄, Molecular orbital theory -LCAO method, construction of M.O. Diagrams for homo-nuclear and hetero-nuclear diatomic molecules (N₂, O₂, CO and NO).</p> <p>HSAB Pearson's concept, HSAB principle & its importance, bonding in Hard-Hard and Soft-Soft combinations (applications).</p> <p>Stereochemistry of carbon compounds Optical isomerism: Optical activity- wave nature of light, plane polarised light, optical rotation and specific rotation. Chiral molecules- definition and criteria(Symmetry elements)- Definition of enantiomers and diastereomers – Explanation of optical isomerism with examples- Glyceraldehyde, Lactic acid, Alanine, Tartaric acid, 2,3-dibromopentane. D,L, R,S and E,Z- configuration with examples. Definition of Racemic mixture – Resolution of racemic mixtures (any 3 techniques).</p> | | Assignment | | Conducted | | Quiz | | Conducted | |
| | | | | Assignment | | Conducted | | Student seminars | | Conducted | |
| | | | | Mid-Exams | | Conducted | | | | | |

| SRI Y.N.COLLEGE (Autonomous), NARSAPUR-534275 | | | | | | | | | | | |
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| ANNUAL CURRICULAR PLAN-YEAR 2020-2021 | | | | | | | | | | | |
| II B.Sc., Paper – III, Name of the lecturer: Dr. B. Ananda Kumar, D. Suresh | | | | | | | | | | | |
| S. No | Month | Syllabus-Topic | Additional inputs Value Addition | Curricular activity | | | | Co-curricular activity | | | |
| | | | | Activity | Hours allotted | Whether Conducted | If not alternate days | Activity | Hours allotted | Whether Conducted | If not alternate days |
| | Nov-2020 | 1. Chemistry of d-block elements: Characteristics of d-block elements with special reference to electronic configuration, variable valence, magnetic properties, catalytic properties and ability to form complexes. Stability of various oxidation states. Comparative treatment of second and third transition series with their 3d analogues. | Colour and d-d transitions | Assignment | | Conducted | | Quiz | | Conducted | |
| | Dec-2020 | 2. Theories of bonding in metals: Metallic properties and its limitations, Valence bond theory, Free electron theory, Explanation of thermal and electrical conductivity of metals, limitations, Band theory, formation of bands, explanation of conductors, semiconductors and insulators. | | | | | | Industrial visit | | Conducted | |
| | | 3. Metal carbonyls: EAN rule, classification of metal carbonyls, structures and shapes of metal carbonyls of V, Cr, Mn, Fe, Co and Ni. | | Assignment | | Conducted | | | | | |
| | | 4. Chemistry of f-block elements: Chemistry of lanthanides - electronic structure, oxidation states, lanthanide contraction, consequences of lanthanide contraction, | | | | | | | | | |

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| | | <p>magnetic properties. Chemistry of actinides - electronic configuration, oxidation states, actinide contraction, comparison of lanthanides and actinides.</p> <p style="text-align: center;"><u>UNIT - II (Organic Chemistry)</u></p> <p>1. Halogen compounds</p> <p>Nomenclature and classification of alkyl (into primary, secondary, tertiary), aryl, aryl alkyl, allyl, vinyl, benzyl halides.</p> <p>Nucleophilic aliphatic substitution reaction- classification into SN^1 and SN^2 – reaction mechanism with examples – Ethyl chloride, t-butyl chloride and optically active alkyl halide 2-bromobutane.</p> <p>2. Hydroxy compounds</p> <p>Nomenclature and classification of hydroxy compounds.</p> <p>Alcohols: Preparation with hydroboration reaction, Grignard synthesis of alcohols. Phenols: Preparation i) from diazonium salt, ii) from aryl sulphonates, iii) from cumene. Physical properties- Hydrogen bonding (intermolecular and intramolecular). Effect of hydrogen bonding on boiling point and solubility in water.</p> <p>Identification of alcohols by oxidation with KMnO_4, Ceric ammonium nitrate, Lucas reagent and phenols by reaction with FeCl_3.</p> <p>Chemical properties:</p> <p>a) Dehydration of alcohols.</p> | | | | | | | | | |
| Jan-2021 | | | Assignment | | Conducted | | | | | | |
| | | | Guest lecture | | Conducted | | | | | | |

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| | Feb-2021 | <p>b) Oxidation of alcohols by CrO_3, KMnO_4.</p> <p>c) Special reaction of phenols: Bromination, Kolbe-Schmidt reaction, Riemer-Tiemann reaction, Fries rearrangement, azocoupling, Pinacol-Pinacolone rearrangement.</p> <p>3. Carbonyl compounds</p> <p>Nomenclature of aliphatic and aromatic carbonyl compounds, structure of the carbonyl group. Synthesis of aldehydes from acid chlorides, synthesis of aldehydes and ketones using 1,3-dithianes, synthesis of ketones from nitriles and from carboxylic acids. Physical properties: Reactivity of carbonyl group in aldehydes and ketones.</p> <p>Nucleophilic addition reaction with a) NaHSO_3, b) HCN, c) RMgX, d) NH_2OH, e) PhNHNH_2, f) 2,4 DNPH, g) Alcohols-formation of hemiacetal and acetal. Base catalysed reactions: a) Aldol, b) Cannizzaro's reaction, c) Perkin reaction, d) Benzoin condensation, e) Haloform reaction, f) Knoevenagel reaction. Oxidation of aldehydes-Baeyer-Villiger oxidation of ketones.Reduction: Clemmensen reduction, Wolf-Kishner reduction, MPV reduction, reduction with LiAlH_4 and NaBH_4. Analysis of aldehydes and ketones with a) 2,4-DNPH test, b) Tollen's test, c) Fehling test, d) Schiff's test e) Haloform test (with equation)</p> | Inter and Intra molecular aldol condensation | Mid-1 exams | | Conducted | | | | | |
| | | | | Assignment | | Conducted | | Student seminars | | Conducted | |

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| | Mar-2021 | <p>4. Carboxylic acids and derivatives</p> <p>Nomenclature, classification and structure of carboxylic acids. Methods of preparation by a) Hydrolysis of nitriles, amides b) Hydrolysis of esters by acids and bases with mechanism c) Carbonation of Grignard reagents. Special methods of preparation of aromatic acids by a) Oxidation of side chain. b) Hydrolysis by benzotrichlorides. c) Kolbe reaction.</p> <p>Physical properties: Hydrogen bonding, dimeric association, acidity-strength of acids with examples of trimethyl acetic acid and trichloroacetic acid. Relative differences in the acidities of aromatic and aliphatic acids.</p> <p>Chemical properties: Reactions involving H, OH and COOH groups-salt formation, anhydride formation, acid chloride formation, amide formation and esterification (mechanism). Degradation of carboxylic acids by Huns-Diecker reaction, decarboxylation by Schimdt reaction, Arndt-Eistert synthesis, halogenation by Hell- Volhard- Zelinsky reaction.</p> <p>5. Active methylene compounds</p> <p>Acetoacetic ester: keto-enol tautomerism, preparation by Claisen condensation, Acid hydrolysis and ketonic hydrolysis. Preparation of a) monocarboxylic acids. b) Dicarboxylic acids.</p> | | Assignment | | Conducted | | Student seminars | Cnducted | |
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| | | <p>c) Reaction with urea</p> <p>Malonic ester: preparation from acetic acid.</p> <p>Synthetic applications: Preparation of a) monocarboxylic acids (propionic acid and n-butyric acid). b) Dicarboxylic acids (succinic acid and adipic acid) c) α,β-unsaturated carboxylic acids (crotonic acid). d) Reaction with urea.</p> | | <p>Mid-II Exams</p> <p>Sem end exams</p> | | <p>Conducted</p> <p>Conducted</p> | | | | | | |
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II B.Sc., Paper – IV Name of the lecturer: Dr. B. Ananda Kumar, Ch. Srinivasa Rao

| S. No | Month | Syllabus-Topic | Additional inputs Value Addition | Curricular activity | | | | Co-curricular activity | | | |
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| | Apr-2021 | Spectrophotometry General features of absorption - Beer-Lambert's law and its limitations, transmittance, Absorbance, and molar absorptivity. Single and double beam spectrophotometers. Application of Beer-Lambert law for quantitative analysis of 1. Chromium in $K_2Cr_2O_7$ 2. Manganese in Manganous sulphate | | Assignment | | Yes | | | | | |
| | May-2021 | Electronic spectroscopy: Interaction of electromagnetic radiation with molecules and types of molecular spectra. Energy levels of molecular orbital's (σ , π , n). Selection rules for electronic spectra. Types of electronic transitions in molecules effect of conjugation. Concept of chromospheres and auxochrome. Infra red spectroscopy Different Regions in Infrared radiations. Modes of vibrations in diatomic and polyatomic molecules. Characteristic absorption bands of various functional groups. Interpretation of spectra-Alkanes, Aromatic, | | Assignment | | yes | | Student seminars | | yes | |

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| | Jun-2021 | <p>Alcohols carbonyls, and amines with one example to each.</p> <p>Proton magnetic resonance spectroscopy (^1H-NMR)</p> <p>Principles of nuclear magnetic resonance, equivalent and non-equivalent protons, position of signals. Chemical shift, NMR splitting of signals - spin-spin coupling, coupling constants. Applications of NMR with suitable examples - ethyl bromide, ethanol, acetaldehyde, 1,1,2-tribromo ethane, ethyl acetate, toluene and acetophenone.</p> <p style="text-align: center;"><u>UNIT – II (Physical Chemistry)</u></p> <p>1. Dilute solutions</p> <p>Colligative properties. Raoult's law, relative lowering of vapour pressure, its relation to molecular weight of non-volatile solute. Elevation of boiling point and depression of freezing point. Derivation of relation between molecular weight and elevation in boiling point and depression in freezing point. Experimental methods of determination. Osmosis, osmotic pressure, experimental determination. Theory of dilute solutions. Determination of molecular weight of non-volatile solute from osmotic pressure. Abnormal Colligative properties- Van't Hoff factor.</p> <p>2. Electrochemistry-I</p> <p>Specific conductance, equivalent conductance. Variation of equivalent conductance with dilution. Migration of ions, Kohlrausch's law.</p> | C-13 NMR | | | | | | | | |
| | | | | Assignment | | yes | | Student seminars | | yes | |

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| | | Arrhenius theory of electrolyte dissociation and its limitations. Ostwald's dilution law. Debye-Huckel-Onsagar's equation for strong electrolytes (elementary treatment only). Definition of transport number, determination by Hittorfs method. Application of conductivity measurements- conductometric titrations. | | | | | | Group discussion | | yes | |
| | Jul-2021 | 3. Electrochemistry-II Single electrode potential, sign convention, Reversible and irreversible cells Nernst Equation- Reference electrode, Standard Hydrogen electrode, calomel electrode, Indicator electrode, metal – metal ion electrode, Inert electrode, Determination of EMF of cell, Applications of EMF measurements - Potentiometric titrations. | | Assignment | | yes | | | | | |
| | Aug-2021 | 4. Phase rule Concept of phase, components, degrees of freedom. Thermodynamic Derivation of Gibbs phase rule. Phase equilibrium of one component system - water system. Phase equilibrium of two- component system, solid-liquid equilibrium. Simple eutectic diagram of Pb-Ag system, simple eutectic diagram, desilverisation of lead., NaCl-Water system, Freezing mixtures. | | Mid-Exams | | yes | | | | | |
| | | | | Sem end exams | | yes | | | | | |

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| ANNUAL CURRICULAR PLAN-YEAR 2020-2021 | | | | | | | | | | | |
| III B.Sc., Paper – V | | Name of the lecturer: Dr SB Ronald | | | | | | | | | |
| S. No | Month | Syllabus-Topic | Additional inputs Value Addition | Curricular activity | | | | Co-curricular activity | | | |
| | | | | Activity | Hours allotted | Whether Conducted | If not alternate days | Activity | Hours allotted | Whether Conducted | If not alternate days |
| | Nov-2020 | INORGANIC CHEMISTRY <u>Coordination Chemistry:</u> Important terms and their definitions: - Double salts, Complex ion, Central metal, Ligand, Coordination sphere, Coordination number. IUPAC nomenclature. Bonding Theories: - Werner's theory and Sidgwick's concept of coordination, EAN rule. Valencey Bond Theory- geometries, formation and magnetic properties of the complexes with coordination numbers 4-tetrahedral and square planar complexes and 6-octahedral complexes, limitations of Valency Bond Theory. Crystal Filed Theory:- Splitting of d-orbital in Octahedral, Tetrahedral and Square-planar complexes, low spin and high spin complexes. | John-teller effect | Quiz | | Yes | | Student exchange programme | | yes | |
| | Dec-2020 | <u>Spectral and magnetic properties of metal complexes</u> Electronic absorption spectrum of $[\text{Ti}(\text{H}_2\text{O})_6]^{3+}$ ion. Types of magnetic behavior, spin-only formula, calculation of magnetic moments, Experimental determination of magnetic susceptibility- Gouy method. | | Assignment | | yes | | Industrial visit | | Conducted | |

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| | | <p><u>Stability of metal complexes:</u></p> <p>Factors affecting the stability of metal complexes, chelate effect, determination of composition of complex by Job's method and Mole ratio method.</p> <p style="text-align: center;">ORGANIC CHEMISTRY</p> <p><u>Nitro alkanes</u></p> <p>Nomenclature and classification of nitroalkanes, structure -Tautomerism of nitroalkanes leading to aci and keto form, Preparation of Nitroalkanes, reactivity -halogenations, reaction with HNO₂ (Nitrous acid), Nef reaction, Mannich reaction and Micheal addition reaction.</p> <p><u>Amines:</u></p> <p>Classification into 1°, 2°, 3° Amines and Quaternary ammonium compounds. Preparative methods –</p> <p>1. Ammonolysis of alkyl halides 2. Gabriel synthesis 3. Hoffman's bromamide reaction (mechanism). Reduction of Amides and Schmidt reaction. Physical properties and basic character - Comparative basic strength of Ammonia, methyl amine, dimethyl amine, trimethyl amine and aniline – comparative basic strength of aniline, N-methylaniline and N,N-dimethyl aniline (in aqueous and non-aqueous medium), steric effects and substituent effects. Chemical properties: a) Alkylation b) Acylation c) Carbylamines reaction d) Hinsberg separation e) Reaction</p> | | | | | | | | | |
| Jan-2021 | | | Assignment | | Conducted | | | Group discussion | | Conducted | |
| | | | Mid-I Exams | | Conducted | | | | | | |

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| | Feb-2021 | <p>with Nitrous acid of 1°, 2°, 3° (Aliphatic and aromatic amines). Electrophilic substitution of Aromatic amines – Bromination and Nitration. Diazotization.</p> <p><u>Cyanides and Isocyanides:</u></p> <p>Preparation of Cyanides from: a) Alkyl halides b) from Amides c) from Aldoximes. Preparation of Isocyanides from: Alkyl halides and Amines. Chemical properties of Cyanides and Isocyanides: a) Hydrolysis b) addition of Grignard reagent c) reduction d) oxidation.</p> <p style="text-align: center;">PHYSICAL CHEMISTRY</p> <p><u>Thermodynamics:</u></p> <p>The first law of thermodynamics-statement, definition of internal energy and enthalpy. Heat capacities and their relationship. Joule-Thomson effect- coefficient. Calculation of w, for the expansion of perfect gas under isothermal and adiabatic conditions for reversible processes. State function. Temperature dependence of enthalpy of formation-Kirchhoff's equation. Second law of thermodynamics. Different Statements of the law. Carnot cycle and its efficiency. Carnot theorem.</p> | | | | | | Student seminars | | Conducted | |
| | | | | Assignment | | yes | | | | | |
| | Mar-2021 | <p>Concept of entropy, entropy as a state function, entropy changes in reversible and irreversible processes. Entropy changes in spontaneous and equilibrium processes.</p> | | Mid-II Exams | | Conducted | | | | | |
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| ANNUAL CURRICULAR PLAN-YEAR 2020-2021 | | | | | | | | | | | |
| III B.Sc., Paper – VI | | | | Name of the lecturer: P. Sahithi | | | | | | | |
| S. No | Month | Syllabus-Topic | Additional inputs Value Addition | Curricular activity | | | | Co-curricular activity | | | |
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| | Nov-2020 | <u>INORGANIC CHEMISTRY</u> Reactivity of metal complexes: Labile and inert complexes, ligand substitution reactions - SN^1 and SN^2 , substitution reactions of square planar complexes - Trans effect and applications of trans effect. Bioinorganic chemistry: Essential elements, biological significance of Na, K, Mg, Ca, Fe, Co, Ni, Cu, Zn and Cl ⁻ . Metalloporphyrins – Structure and functions of hemoglobin, Myoglobin and Chlorophyll. | | Assignment | | yes | | Quiz | yes | | |
| | Dec-2020 | <u>PHYSICAL CHEMISTRY</u> Chemical kinetics Rate of reaction - Definition of order and molecularity. Derivation of rate constants for first, second, third and zero order reactions and examples. Derivation for time half change. Methods to determine the order of reactions. Effect of temperature on rate of reaction, Arrhenius equation, concept of activation energy. Photochemistry Difference between thermal and photochemical processes. Laws of | | Assignment | | yes | | Student exchange programme | | yes | |
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| | | <p>photochemistry- Grothus-Draper's law and Stark-Einstein's law of photochemical equivalence. Quantum yield-Photochemical reaction mechanism- hydrogen- chlorine, hydrogen- bromine reaction. Qualitative description of fluorescence, phosphorescence, Photosensitized reactions- energy transfer processes (simple example)</p> <p><u>ORGANIC CHEMISTRY</u></p> <p>Heterocyclic Compounds</p> <p>Introduction and definition: Simple five membered ring compounds with one hetero atom Ex. Furan. Thiophene and pyrrole - Aromatic character – Preparation from 1,4,- dicarbonyl compounds, Paul-Knorr synthesis.</p> <p>Properties : Acidic character of pyrrole - electrophilic substitution at 2 or 5 position, Halogenation, Nitration and Sulphonation under mild conditions - Diels Alder reaction in furan.</p> <p>Pyridine – Structure - Basicity - Aromaticity - Comparison with pyrrole - one method of preparation and properties - Reactivity towards Nucleophilic substitution reaction.</p> <p>Carbohydrates</p> <p>Monosaccharides: (+) Glucose (aldo hexose) - Evidence for cyclic structure of glucose (some negative aldehydes tests and mutarotation) - Proof for the ring size (methylation, hydrolysis and oxidation reactions)</p> | | | | | | | | | |
| | Jan-2021 | | Conformation of glucosides, sucrose and maltose | Assignment | | yes | | | Student seminars | yes | |

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| | Feb-2021 | <p>- Pyranose structure (Haworth formula and chair conformational formula).</p> <p>(-) Fructose (ketohexose) - Evidence of 2 - ketohexose structure (formation of pentaacetate, formation of cyanohydrin its hydrolysis and reduction by HI). Cyclic structure for fructose (Furanose structure and Haworth formula) - osazone formation from glucose and fructose – Definition of anomers with examples.</p> <p>Interconversion of Monosaccharides:</p> <p>Aldopentose to Aldohexose (Arabinose to D- Glucose, D-Mannose) (Kiliani - Fischer method). Epimers, Epimerisation - Lobry de bruyn van Ekenstein rearrangement. Aldohexose to Aldopentose (D-Glucose to D- Arabinose) by Ruff degradation.</p> <p>Aldohexose to Ketohexose [(+) Glucose to (-) Fructose] and Ketohexose to Aldohexose (Fructose to Glucose)</p> <p>Amino acids and proteins</p> <p>Introduction: Definition of Amino acids, classification of Amino acids into alpha, beta, and gamma amino acids. Natural and essential amino acids - definition and examples, classification of alpha amino acids into acidic, basic and neutral amino acids with examples. Methods of synthesis: General methods of synthesis of alpha amino acids (specific examples - Glycine, Alanine, valine and leucine) by following methods:</p> | Isolation and analysis of amino acids from proteins | Mid-I exams | | yes | | Guest lecture | | yes | |
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| | Mar-2021 | <p>a) from halogenated carboxylic acid b) Malonic ester synthesis c) strecker's synthesis.</p> <p>Physical properties: Zwitter ion structure - salt like character - solubility, melting points, amphoteric character, definition of isoelectric point.</p> <p>Chemical properties: General reactions due to amino and carboxyl groups - lactams from gamma and delta amino acids by heating peptide bond (amide linkage). Structure and nomenclature of peptides and proteins.</p> | | Mid-II Exams | | Yes | | | | | | |
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III B.Sc., Paper – VII Name of the lecturer: Dr. SB Ronald, P.Sahithi

| S. No | Month | Syllabus-Topic | Additional inputs Value Addition | Curricular activity | | | | Co-curricular activity | | | |
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| | | | | Activity | Hours allotted | Whether Conducted | If not alternate days | Activity | Hours allotted | Whether Conducted | If not alternate days |
| | Apr-2021 | Introduction Concept, scope and importance of Environmental Chemistry - Definitions of some terms used in Environmental Chemistry: Pollutant, Contaminant, Receptor, Sink, TLV- Segments of environment, Renewable resources: Solar and Biomass energy-Non-renewable resources: Thermal power and atomic energy - Reactions of atmospheric oxygen and Hydrological cycle. | | Assignment | | yes | | | | | |
| | May-2021 | Air Pollution Definition – Sources of air pollution – Classification of air pollutants – Acid rain – Photochemical smog – Green house effect – Formation and depletion of ozone – Bhopal gas disaster – Controlling methods of air pollution | | Assignment | | yes | | | | | |
| | Jun-2021 | Chemical Toxicology Toxic chemicals in the environment – effects of toxic chemicals – cyanide and its toxic effects – pesticides and its biochemical effects – toxicity of lead, mercury, arsenic and cadmium. | | | | | | Student seminars | | yes | |
| | | Water pollution Unique physical and chemical properties of water - Classification of water pollutants - Dissolved oxygen, BOD, COD- Hardness of water - Methods to convert temporary hard water into soft water- Methods to convert permanent hard water into soft water- Eutrophication and its effects- Methods of purifying waste water(Waste water treatment) | | Assignment | | yes | | | | | |

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| | Jul-2021 | Ecosystem and biodiversity Ecosystem: Concepts – structure – Functions and types of ecosystem – Abiotic and biotic components – Energy flow and Energy dynamics of ecosystem – Food chains – Food web – Tropic levels – Biogeochemical cycles (carbon, nitrogen and phosphorus) Biodiversity: Definition – level and types of biodiversity – concept - significance – magnitude and distribution of biodiversity - biogeographical classification of India - biodiversity at national, global and regional level. | | Assignment | | yes | | Group discussion | | yes | |
| | Aug-2021 | | | Mid-Exams | | yes | | | | | |
| | | | | Sem end exams | | yes | | | | | |

| SRI Y.N.COLLEGE (Autonomous), NARSAPUR-534275 | | | | | | | | | | | |
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| ANNUAL CURRICULAR PLAN-YEAR 2020-2021 | | | | | | | | | | | |
| III B.Sc., Cluster – I, Name of the lecturer: ChRVR Prasad | | | | | | | | | | | |
| S. No | Month | Syllabus-Topic | Additional inputs Value Addition | Curricular activity | | | | Co-curricular activity | | | |
| | | | | Activity | Hours allotted | Whether Conducted | If not alternate days | Activity | Hours allotted | Whether Conducted | If not alternate days |
| | Apr-2021 | UNIT –I Review of energy sources (renewable and non-renewable) – classification of fuels and their calorific value. Coal: Uses of Coal (fuel and non fuel) in various industries, its composition, carbonization of coal. Coal gas, producer gas and water gas –Manufacture, composition and uses. Fractionation of coal tar – uses of coal tar based chemicals, requisites of a good metallurgical coke, coal gasification (Hydro gasification and catalytic gasifi | | Assignment | | yes | | Student seminars | | yes | |
| | May-2021 | Unit – II Lubricants Classification of lubricants, lubricating oils (conducting and non-conducting), solid and semi solid lubricants, synthetic lubricants. Properties of lubricants (viscosity index, cloud point, pore point) and their determination. Applications of lubricants. UNIT-III Crude petroleum and petrochemicals: Composition of crude petroleum, refining of petroleum and different types of petroleum products and their applications. Petro chemicals: | | Assignment | | yes | | | | | |

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| | Jun-2021 | vinyl acetate, propylene oxide, isoprene, butadiene, toluene and its derivative xylene. | | | | | | | | | |
| | | UNIT-IV | | | | | | | | | |
| | | Fractional distillation (principle and process), cracking (Thermal and catalytic cracking). Reforming (Thermal and catalytic) Petroleum and non petroleum fuels. LPG, CNG, LNG, bio-gas, fuels derived from biomass, fuel from waste, synthetic fuels (gaseous and liquids). | | Assignment | | yes | | | | | |
| | Jul-2021 | UNIT-V | | | | | | | | | |
| | | Batteries | | | | | | | | | |
| | | Primary and secondary batteries, battery components and their role, Characteristics of Battery. Working of following batteries: Pb acid, Li-Battery. Fuel cells and Solar cell. | | Assignment | | Yes | | Group discussion | | yes | |
| | | | | Mid-Exams | | Yes | | | | | |
| | Aug-2021 | | | Sem end exams | | yes | | | | | |

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| ANNUAL CURRICULAR PLAN-YEAR 2021-2022 | | | | | | | | | | | |
| III B.Sc., Cluster – II Name of the lecturer: Ch. Udaya Bhaskara Rao | | | | | | | | | | | |
| S. No | Month | Syllabus-Topic | Additional inputs Value Addition | Curricular activity | | | | Co-curricular activity | | | |
| | | | | Activity | Hours allotted | Whether Conducted | If not alternate days | Activity | Hours allotted | Whether Conducted | If not alternate days |
| | Apr-2021 | <u>. INORGANIC MATERIALS OF INDUSTRIAL IMPORTANCE</u> Recapitulation of <i>s</i>- and <i>p</i>-Block Elements Periodicity in <i>s</i> - and <i>p</i> -block elements with respect to electronic configuration, atomic and ionic size, ionization enthalpy, electro negativity (Pauling, Mullikan and Alfred – Rochow scales). Allotropy in C, S, and P. Oxidation states with reference to elements in unusual and rare oxidation states like carbides and nitrides), inert pair effect, diagonal relationship and anomalous behavior of first member of each group. | | Assignment | | yes | | | | | |
| | May-2021 | Silicate Industries Glass: Glassy state and its properties, classification (silicate and non-silicate glasses). Manufacture and processing of glass. Composition and properties of the following types of glasses: Soda lime glass, lead glass, armoured glass, safety glass, borosilicate glass, fluorosilicate, coloured glass, photosensitive glass. Ceramics: Important clays and feldspar, ceramic, their types and manufacture. High technology ceramics and their applications, | | Assignment | | yes | | | | | |

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| | Jun-2021 | <p>superconducting and semiconducting oxides, fullerenes, carbon nanotubes and carbon fibre.</p> <p>Cements: Classification of cement, ingredients and their role, Manufacture of cement and the setting process, quick setting cements.</p> <p>Fertilizers: Different types of fertilizers. Manufacture of the following fertilizers: Urea, ammonium nitrate, calcium ammonium nitrate, ammonium phosphate, polyphosphate, superphosphate, compound and mixed fertilizers, potassium chloride, potassium sulphate.</p> <p>Surface Coatings: Objectives of coatings surfaces, classification of surface coatings. Paints and pigments-formulation, composition and related properties. Oil paint, Vehicle, modified oils, Pigments, toners and lakes pigments, Fillers, Thinners, Enamels, emulsifying agents. Special paints (Heat retardant, Fire retardant, Eco-friendly paint, Plastic paint), Dyes, methods of dying, classification of dyes, Wax polishing, Water and Oil paints, additives, Metallic coatings (electrolytic and electrolysis).</p> | | Assignments | | Yes | | Student seminars | | yes | |
| | Jul-2021 | <p>Alloys: Classification of alloys, ferrous and non-ferrous alloys, Specific properties of elements in alloys. Manufacture of Steel (removal of</p> | | Assignment | | yes | | Group discussion | | yes | |

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| | Aug-2021 | <p>silicon decarbonization, demanganization, desulphurization dephosphorisation) and surface treatment (argon treatment, heat treatment, nitriding, carburizing). Composition and properties of different types of steels.</p> <p>Chemical explosives:</p> <p>Origin of explosive properties in organic compounds, preparation and explosive properties of</p> <p>lead azide, PETN, cyclonite (RDX). Introduction to rocket propellants.</p> | | Mid-Exams | | Yes | | | | | | |
| | | | | Sem end exams | | yes | | | | | | |

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| ANNUAL CURRICULAR PLAN-YEAR 2020-2021 | | | | | | | | | | | |
| III B.Sc., Cluster – III, Name of the lecturer: Ch RVR Prasad | | | | | | | | | | | |
| S. No | Month | Syllabus-Topic | Additional inputs Value Addition | Curricular activity | | | | Co-curricular activity | | | |
| | | | | Activity | Hours allotted | Whether Conducted | If not alternate days | Activity | Hours allotted | Whether Conducted | If not alternate days |
| | Apr-2021 | <u>ANALYSIS OF APPLIED INDUSTRIAL PRODUCTS</u> UNIT-I Analysis of soaps: moisture and volatile matter, combined alkali, total fatty matter, free alkali, total fatty acid. Analysis of oils: saponification value, iodine value, acid value, ester value. UNIT- II Analysis of paints : Vehicle and pigments, Barium Sulphate, total lead, lead chromate, iron pigments, zinc chromate. Analysis of starch, sugars, cellulose and paper. UNIT-III Analysis of fertilizers: urea, super phosphate. Analysis of Pesticides: DDT, BHC. UNIT -IV Analysis of industrial solvents like benzene, acetone, methanol and acetic acid, Gas analysis: carbon dioxide, carbon monoxide, oxygen, hydrogen, | | Assignment | | yes | | | | | |
| | May-2021 | | | Assignment | | yes | | Student seminar | | yes | |
| | Jun-2021 | | | Assignments | | yes | | | | | |

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| | Jul-2021 | <p>saturated hydro carbons, unsaturated hydrocarbons, nitrogen, octane number, cetane number.</p> <p>Proximate and Ultimate analysis of coal: carbon, hydrogen, nitrogen, oxygen, phosphorus and sulfur.</p> <p>UNIT - V</p> <p>Analysis of cement- loss on ignition, insoluble residue, total silica, sesqui oxides, lime, ferric oxide, sulphuric anhydride.</p> <p>Analysis of glasses - Determinaiton of silica, sulphur, calcium, magnesium, chloride.</p> | | Assignment | | yes | | Group discussion | | yes | |
| | Aug-2021 | | | Mid-Exams | | Yes | | | | | |
| | | | | Sem end exams | | yes | | | | | |