

DEPARTMENT OF CHEMISTRY, SRI Y.N.COLLEGE (Autonomous), NARSAPUR-534275

Chemistry, ANNUAL CURRICULAR PLAN-YEAR 2022-2023

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

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
	OCT-22	<p><b>Chemistry of p-block elements :</b></p> <p><b>Group -13:</b> Preparation and structure of Diborane and Borazine.</p> <p><b>Group -14:</b> Preparation, classification and uses of silicones.</p> <p><b>Group-15:</b> Preparation and structures of Phosphonitrilic halides <math>\{(PNCI_2)_n</math> where <math>n=3,4\}</math></p> <p><b>Group -16:</b> Oxides and Oxoacids of sulphur (structures only)</p> <p><b>Group -17:</b> Structures of Inter halogen compounds and pseudo halogens.</p>	Hydrazine and Hydroxylamine	Orientation course		Yes					
	NOV	<p><b>Chemistry of d-block elements :</b></p> <p>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.</p> <p><b>Chemistry of f-block elements:</b></p> <p>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.</p>		Assignment -1		Yes					

	DEC-22	<p><b>Theories of bonding in metals:</b> Valence bond theory, Free electron theory, Explanation of thermal and electrical conductivity of metals based on these theories, Band theory-formation of bands.</p> <p style="text-align: center;"><b><u>UNIT-I (Physical Chemistry)</u></b></p> <p><b>Solid state:</b> 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.</p> <p><b>Gaseous state:</b> Vander Waal's equation of state. Critical phenomena. Relationship between critical constants and vanderWaal's constants. Law of corresponding states. Joule Thomson effect.</p> <p><b>Liquid state:</b> 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.</p>		Assignment -2		Yes		Student seminars		Yes	
				Assignment -3		yes					

	JAN-23	<p><b>Solutions:</b> Liquid-liquid - ideal solutions, Raoult's law. Ideally dilute solutions, Henry's law. Azeotropes-HCl-H<sub>2</sub>O, ethanol-water systems. Partially miscible liquids- phenol-water system. Effect of impurity on consolute temperature. Nernst distribution law. Applications of distribution law.</p> <p><b>Ionic equilibrium:</b> Ionic product, common ion effect, solubility and solubility product. Calculations based on solubility product.</p> <p><b>Dilute solutions</b> 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</p>		Assignment -4		Yes		Student seminars		Yes	
				Assignment -5		Yes					



## I B.Sc., SEMESTER-II, Paper – II, Name of the lecturer: Ch. Udaya Bhaskar Rao, ChRVR Prasad, Ch Sujitha

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
	MAR-23	<p><b>. UNIT-IV(Organic Chemistry)</b>  <b>Carbon-Carbon sigma bonds (Alkanes and Cycloalkanes)</b>            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.</p>		Assignment 1		yes					
	APR-23	<p><b>Carbon–Carbon pi Bonds (Alkenes and Alkynes)</b>            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<sub>2</sub>, X<sub>2</sub>, 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.</p> <p><b>Benzene and its reactivity</b>            Concept of aromaticity, Huckel's rule - application to Benzenoid) (Benzene, Naphthalene and Non - Benzenoid compounds (cyclopropenylcation, cyclopentadienyl anion and tropyliumcation)            Reactions - General mechanism of electrophilic aromatic substitution, mechanism of nitration, Friedel- Craft's alkylation and acylation.</p>		Assignment 2		Yes		Student seminars		yes	
				Assignment 3		yes					

	<p>Orientation of aromatic substitution - ortho, para and meta directing groups. Ring activating and deactivating groups with examples (Electronic interpretation of various groups like NO<sub>2</sub> 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><b><u>UNIT-IV(General Chemistry)</u></b></p> <p><b>Surface chemistry</b>  <b>Colloids</b> - Coagulation of colloids- Hardy-Schulze rule. Stability of colloids, Protection of Colloids, Gold number.  <b>Adsorption</b> - Physical and chemical adsorption, Langmuir adsorption isotherm, applications of adsorption</p> <p><b>Chemical Bonding</b>  Valence bond theory, hybridization, VB theory as applied to ClF<sub>3</sub>, Ni(CO)<sub>4</sub>, Molecular orbital theory -LCAO method, construction of M.O. Diagrams for homo-nuclear and hetero-nuclear diatomic molecules (N<sub>2</sub>, O<sub>2</sub>, CO and NO).</p> <p><b>HSAB</b>  Pearson's concept, HSAB principle &amp; its importance, bonding in Hard-Hard and Soft-Soft combinations (applications).</p>										
MAY-23			Assignment 4		yes			Student seminars		yes	
JUN-23	<p><b>Stereochemistry of carbon compounds</b>  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.</p>		Assignment 5		yes						

		D,L, R,S and E,Z- configuration with examples. Definition of Racemic mixture – Resolution of racemic mixtures (any 3 techniques).										
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ANNUAL CURRICULAR PLAN-YEAR 2022-2023

**II B.Sc., SEMESTER-III, Paper – III, Name of the lecturer: D. Suresh, Ch Srinivasa 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
	OCT-22	<p><b>Chemistry of Halogenated Hydrocarbons:</b> Alkyl Halides: Methods of preparation and properties, nucleophilic substitution reactions– SN<sub>1</sub> and SN<sub>2</sub> mechanisms with stereo chemical aspects. Aryl Halides: Preparation and properties, nucleophilic aromatic substitution; Relative reactivity of alkyl, allyl, benzyl, vinyl and aryl halides towards nucleophilic substitution reactions</p> <p><b>Alcohols &amp; Phenols</b> Alcohols: preparation and properties, Bouvet Blanc Reduction; Oxidation Of Diols by Per iodic acid and lead Tetraacetate, Pinacol-Pinacolone Rearrangement; Phenols: Preparation And Properties; Acidity of phenols, Reimer-Tiemann and Kolbe's-Schmidt Reactions, Fries and Claisen Rearrangement with mechanism;</p>		Assignment		Yes					
	NOV-22	<p><b>Carbonyl Compounds:</b> Structure, reactivity, preparation and properties; Nucleophilic Addition, Nucleophilic Addition-elimination reactions with ammonia derivatives Mechanisms of Aldol and Benzoin Condensation, Claisan-Schmidt, Perkin, Cannizzaro and Wittig reaction, Beckmann Haloform Reaction And Baeyer Villiger oxidation, oxidations and reductions (Clemmensen, wolf –kishner, with LiAlH<sub>4</sub> &amp; NaBH<sub>4</sub>).</p>		Assignment		Yes		Student Seminars		Yes	



	DEC-22	<p><b>Active Methylene Compounds:</b> Ethyl acetoacetate: keto-enol tautomerism, preparation by Claisen condensation, <b>Synthetic applications:</b> Preparation of a) monocarboxylic acids. b) Dicarboxylic acids. c) Reaction with urea Diethyl malonate: preparation from acetic acid. <b>Synthetic applications:</b> Preparation of a) monocarboxylic acids (propionic acid and n-butyric acid). b) Dicarboxylic acids (succinic acid and adipic acid) c) <math>\alpha,\beta</math>-unsaturated carboxylic acids (crotonic acid). d) Reaction with urea.</p> <p><b>Carboxylic Acids and their Derivatives :</b> General methods of preparation, physical properties and reactions of monocarboxylic acids, effect of substituent acidic strength. Preparation And Reactions Of Acid Chlorides, anhydrides, esters and amides; Claisen Condensation, Reformatsky reactions and Curtius Rearrangement 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><b>(SPECTROSCOPY)</b> <b>Spectrophotometry:</b> 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 <math>K_2Cr_2O_7</math> 2. Manganese in Manganous sulphate</p> <p><b>Vibrational Spectroscopy:</b> Classical Equation of Vibration, computation of force constant, Harmonic and anharmonic oscillator,</p>		Assignment		Yes					
				Assignment		Yes					

	JAN-23	<p>Morse Potential curve, vibrational degrees of freedom for polyatomic molecules, Modes of vibrations in diatomic and polyatomic molecules. Selection rules for vibrational transitions, Fundamental Frequencies, overtones and hot bands. functional group and fingerprint region.</p> <p><b>Electronic spectroscopy:</b> Interaction of electromagnetic radiation with molecules and types of molecular spectra. Energy levels of molecular orbitals (<math>\sigma</math>, <math>\pi</math>, n). Selection rules for electronic spectra. Types of electronic transitions in molecules, effect of conjugation. Concept of chromophore and auxochrome. bathochromic and hypsochromic shifts.</p> <p><b>Nuclear Magnetic Resonance (NMR) spectroscopy:</b> 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>Application of Spectroscopy to Simple Organic Molecules Application of visible, ultraviolet and Infrared spectroscopy in organic molecules. Application of electronic spectroscopy and Woodward rules for calculating <math>\lambda_{max}</math> of conjugated dienes and <math>\alpha, \beta</math> – unsaturated compounds.</p> <p>Infrared radiation and types of molecular vibrations, IR spectra of alkanes, alkenes and simple alcohols (inter and intramolecular hydrogen bonding), aldehydes, ketones, carboxylic acids and their derivatives (effect of substitution on <math>&gt;C=O</math> stretching absorptions).</p>		Assignment		Yes		Student seminars		Yes	
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## II B.Sc., SEMESTER-IV, Paper – IV Name of the lecturer: Ch. Srinivasa Rao, Dr.D.Suresh, P.Sahithi

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
	Mar-2023	<p align="center"><b><u>(INORGANIC &amp; ORGANIC CHEMISTRY)</u></b></p> <p><b>Organ metallic Compounds:</b> Definition and classification of organometallic compounds on the basis of bond type, Metal Carbonyls:18-electron rule, General methods of preparation of mono and binuclear carbonyls of 3d series. P-acceptor behaviour of carbon monoxide.</p> <p><b>Carbohydrates:</b> Classification and their biological importance, Monosaccharides: Constitution and absolute configuration glucose and fructose (open chain and cyclic structure), epimers and anomers, mutarotation, osazone formation from glucose and fructose Interconversions of Aldohexose to Ketohexose [(+) Glucose to (-) Fructose] and Ketohexose to Aldohexose (Fructose to Glucose) Kiliani-Fischer synthesis and Ruff degradation;</p> <p><b>Amino acids and proteins:</b> Introduction: Definition of Amino acids, classification of Amino acids into alpha, beta, and gamma amino acids. Essential and Non-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: a) from halogenated carboxylic acid b) Gabriel Phthalimide 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>		Assignment		Yes					
	Apr 2023			Assignment		Yes	Student seminars		Yes		

	May 2023	<p>Chemical properties: General reactions due to amino and carboxyl groups - lactams from gamma and delta amino acids by heating- peptide bond (amide linkage).</p> <p><b>Heterocyclic Compounds:</b> 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. Properties: Acidic character of pyrrole - electrophilic substitution at 2 or 5 position, Halogenation, Nitration and Sulphonation under mild conditions - Diels Alder reaction in furan. Pyridine – Structure - Basicity - Aromaticity- Comparison with pyrrole- one method of preparation and properties - Reactivity towards Nucleophilic substitution reaction.</p> <p>(ORGANIC &amp; PHYSICAL CHEMISTRY)</p> <p><b>Nitro hydrocarbons</b> Nomenclature and classification-nitro hydrocarbons, structure - Tautomerism of nitroalkanes leading to aci and keto form, Preparation of Nitroalkanes, reactivity -halogenation, reaction with HONO (Nitrous acid), Nef reaction and Mannich reaction leading to Micheal addition and reduction.</p> <p><b>Amines:</b> Introduction, classification, chirality in amines (pyramidal inversion), importance and general methods of preparation. Properties : Physical properties, Basicity of amines: Effect of substituent, solvent and steric effects. Distinction between Primary, secondary and tertiary amines using Hinsberg's Method And Nitrous Acid. Discussion of the following reactions with emphasis on the mechanistic pathway: Gabriel Phthalimide synthesis, Hoffmann-Bromamide Reaction, Carbylamine Reaction, Mannich reaction, Hoffmann's exhaustive methylation, Hofmann-elimination reaction and Cope elimination.</p>	C-13 NMR	Assignment		Yes					
				Assignment		Yes					

	Jun-2023	<p><b>Photochemistry:</b> Difference between thermal and photochemical processes, Laws of photochemistry- Grothus- Draper's law and Stark-Einstein's law of photochemical equivalence, Quantum yield- Photochemical reaction mechanism- hydrogen- chlorine and hydrogen-bromine reaction. Qualitative description of fluorescence, phosphorescence, Photosensitized reactions.</p> <p><b>Thermodynamics:</b> The first law of thermodynamics-statement, definition of internal energy and enthalpy, Heat capacities and their relationship, Joule-Thomson effect- coefficient, Calculation of work for the expansion of perfect gas under isothermal and adiabatic conditions for reversible processes, State function. Temperature dependence of enthalpy of formation- Kirchoffs equation, Second law of thermodynamics Different Statements of the law, Carnot cycle and its efficiency, Carnot theorem, Concept of entropy, entropy as a state function, entropy changes in reversible and irreversible processes. Entropy changes in spontaneous and equilibrium processes. Third law of thermodynamics, Nernst heat theorem, Spontaneous and non-spontaneous processes, Helmholtz and Gibbs energies-Criteria for spontaneity.</p>		Assignment		Yes		Student seminars		Yes	
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## III B.Sc., SEMESTER-IV, Paper – V Name of the lecturer: Dr SB Ronald, Dr B. Ananda Kumar

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
	Mar-2023	(INORGANIC CHEMISTRY)		Assignment		Yes					
	Apr 2023	<p><b>Coordination Chemistry:</b> IUPAC nomenclature of coordination compounds, Structural and stereoisomerism in complexes with coordination numbers 4 and 6. Valence Bond Theory (VBT): Inner and outer orbital complexes. Limitations of VBT, Crystal Field Theory:- Splitting of d-orbitals in Octahedral, Tetrahedral and Square-planar complexes, Crystal field stabilization energy (CFSE), Crystal field effects for weak and strong fields. Factors affecting the magnitude of crystal field splitting energy, Spectrochemical series, Comparison of CFSE for Octahedral and Tetrahedral complexes, Jahn-Teller distortion.</p> <p><b>Inorganic Reaction Mechanism:</b> Introduction to inorganic reaction mechanisms. Concept of reaction pathways, transition state, intermediate and activated complex. Labile and inert complexes, ligand substitution reactions -SN1 and SN2, Substitution reactions in square planar complexes, Trans-effect, theories of trans effect and its applications</p> <p><b>Stability of metal complexes:</b> Thermodynamic stability and kinetic stability, factors affecting the stability of metal complexes, chelate effect, determination of composition of complex by Job's method and molar ratio method.</p> <p><b>Bioinorganic Chemistry:</b> Metal ions present in biological systems, classification of elements according to their action in biological system.</p>	John-teller effect	Assignment		Yes		Student seminars		Yes	



	<p>May 2023</p>	<p>biological significance of Na, K, Mg, Ca, Fe and Cl<sup>-</sup>. Excess and deficiency of some trace metals. Toxicity of metal ions (Hg, Pb, Cd and As), reasons for toxicity, Use of chelating agents in medicine, Cis-platin as an anti-cancer drug. Metalloporphyrins – Structure and functions of hemoglobin and Chlorophyll.</p> <p>(PHYSICAL CHEMISTRY)</p> <p><b>Phase rule:</b> Concept of phase, components, degrees of freedom. Thermodynamic derivation of Gibbs phase rule. Phase diagram of one component system - water system, Study of Phase diagrams of Simple eutectic systems i) Pb-Ag system, desilverisation of lead ii) NaCl-Water system, Congruent and incongruent melting point- Definition and examples for systems having congruent and incongruent melting point , freezing mixtures.</p> <p><b>Electrochemistry:</b> Specific conductance, equivalent conductance and molar conductance- Definition and effect of dilution. Cell constant. Strong and weak electrolytes, Kohlrausch's law and its applications, Definition of transport number, determination of transport number by Hittorf's method. Debye-Huckel-Onsager's equation for strong electrolytes (elementary treatment only), Application of conductivity measurements- conduct metric titrations. Electrochemical Cells- Single electrode. potential, Types of electrodes with examples: Metal- metal ion, Gas electrode, Inert electrode, Redox electrode, Metal-metal insoluble salt- salt anion. Determination of EMF of a cell, Nernst equation, Applications of EMF measurements - Potentiometric titrations. Fuel cells- Basic concepts, examples and applications</p> <p><b>Chemical Kinetics:</b> The concept of reaction rates. Effect of temperature, pressure, catalyst and other factors on reaction rates. Order and molecularity of a reaction, Derivation of integrated rate equations</p>		<p>Assignment</p> <p>Assignment</p>		<p>Yes</p> <p>Yes</p>		<p>Student seminars</p>	<p>Yes</p>	
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		<p>for zero, first and second order reactions (both for equal and unequal concentrations of reactants). Half-life of a reaction. General methods for determination of order of a reaction. Concept of activation energy and its calculation from Arrhenius equation. Theories of Reaction Rates: Collision theory and Activated Complex theory of bimolecular reactions. Comparison of the two theories (qualitative treatment only). Enzyme catalysis- Specificity, factors affecting enzyme catalysis,</p>		Assignment		Yes						
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**III B.Sc., SEMESTER-V, Paper – VI (Environmental Chemistry) Name of the lecturer: Dr. SB Ronald, P. Sahithi**

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
	Oct-2022	<b>Introduction</b> Environment Definition – Concept of Environmental chemistry- Scope and importance of environmental chemistry in nowadays – Nomenclature of environmental chemistry – Pollution, Pollutant, Contaminant, Receptor, Sink, Pathway of a pollutant, Threshold limit value (TLV) Segments of environment– Composition and Structure of Atmosphere with temperature profile. Natural resources–Renewable Resources–Solar and biomass energy and Nonrenewable resources – Thermal power and atomic energy – Reactions of atmospheric oxygen and Hydrological cycle.		Assignment		Yes					
	Nov-2022	<b>Air Pollution</b> Definition – Sources of air pollution – Classification of air pollutants – Acid rain – Photochemical smog – Global warming-Green house effect – Formation and depletion of ozone layer– Bhopal gas disaster – Controlling methods of air pollution.		Assignment		Yes		Student seminar		Yes	
	Dec-2022	<b>Chemical Toxicology</b> 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. Solid waste management									
		<b>Water pollution</b> Unique physical and chemical properties of water – Classification of water pollutants – Dissolved oxygen		Assignment		Yes					

		<p>– 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. Waste water treatment- Purification of waste water</p>								
Jan-2023	<p><b>Ecosystem</b>  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)</p> <p><b>Biodiversity</b>  Definition – level and types of biodiversity – concept- significance – magnitude and distribution of biodiversity–trends-bio geographical classification of India–biodiversity at national, global and regional level. Necessityof protecting the biodiversity.</p>	Assignment	Yes	Student seminars	Yes					
		Assignment	Yes							

## III B.Sc., SEMESTER-V, Paper – VII (Green Chemistry &amp; Nanotechnology ) Name of the lecturer: Dr. B.Ananda Kumar, 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
	Oct-2022	<p><b>UNIT-I Green Chemistry: Part-I</b></p> <p>Introduction-Definition of green Chemistry, Need for green chemistry, Goals of Green chemistry Basic principles of green chemistry. Green synthesis-Evaluation of the type of the reaction</p> <p>i) Rearrangements (100% atom economic), ii) Addition reaction (100% atom economic). Organic reactions by Sonication method: apparatus required and examples of sonochemical reactions (Heck, Hunds dicker and Wittig reactions).</p>		Assignment		Yes					
	Nov-2022	<p><b>UNIT- II Green Chemistry: Part- II</b></p> <p><b>A) Selection of solvent:</b></p> <p>i) Aqueous phase reactions ii) Reactions in ionic liquids, Heck reaction, Suzuki reactions, epoxidation. iii) Solid supported synthesis</p> <p><b>B) Supercritical CO<sub>2</sub>:</b> Preparation, properties and applications, (decaffeination, drycleaning)</p>		Assignment		Yes		Student seminars		Yes	

	Dec-2022	<p>C) Green energy and sustainability.</p> <p><b>UNIT-III Microwave and Ultrasound assisted green synthesis:</b></p> <p>Apparatus required, examples of MAOS (synthesis of fused anthroquinones, Leukart reductive amination of ketones) - Advantages and disadvantages of MAOS. Aldolcondensation –Cannizzaro reaction- Diels-Alder reactions-Strecker's synthesis</p> <p><b>UNIT-IV: Green catalysis and Green synthesis</b></p> <ol style="list-style-type: none"> <li>Green synthesis of the following compounds: adipic acid, catechol, disodium menudoacetate(alternative Strecker’s synthesis)</li> <li>Microwave assisted reaction in water –Hoffmann elimination – methyl benzoate to benzoic acid –oxidation of toluene and alcohols–microwave assisted reactions in organic solvents. Diels-Alderreactions and decarboxylation reaction.</li> <li>Ultrasound assisted reactions–sonochemical Simmons–Smith reaction (ultrasonic alternative to iodine)</li> </ol>		Assignment		Yes					
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	Jan-2023	<p><b>UNIT – V: Nanotechnology and Material science</b></p> <p>Basic concepts of Nano science and Nanotechnology, Synthetic techniques of nanomaterials - Bottom-up approach and Top down approaches. Classification, properties and application of Nanomaterials.</p> <p><u>Material science:</u></p> <p>Super conductivity-transition temperature, properties and applications of superconductors, Types of superconductors-difference between type-I and type-II superconductors, Meissner effect, magnetic levitation, Composite materials-particle reinforced composites and fibre reinforced composites.</p>		Assignment		Yes				Yes	
				Assignment		Yes		Student seminars			

