DEPARTMENT OF CHEMISTRY (Hons) JULY 2023-JUNE 2024

Honours	Month	No of l	ectures	Торі	ic
		Theory	Practical	Theory	Practical
SEM 1 (NEP) DS – I (Major)	July	6	9	Bohr's theory for hydrogen atom , its limitations and atomic spectra of hydrogen and Bohr's model, Sommerfeld's model. Nomenclature for acyclic compounds only (trivial and IUPAC), DBE, hybridization of C, N, O, halogens. Concept of pressure and temperature. Nature of the distribution of velocities in one dimension (with derivation),	Preparation of Standard solutions of K2Cr2O7. Identification of Pure Organic compounds: methanol, ethanol. Study of viscosity of unknown liquid with respect to water.
	August	9	12	Quantum numbers and their significance, Pauli's exclusion principle, Hund's rule, electronic configuration of many-electron atoms. Bond distance, bond angles, VSEPR, shapes of molecules, inductive and field effects, bond energy, bond polarity and polarisability, dipole moment. Nature of the distribution of velocities two and three dimensions, Maxwell's distribution of speeds in one dimensions	Preparation of Standard solutions of Oxalic Acid and secondary standard Mohr's Salt, Standardization of Mohr's Salt. Identification of Pure Organic compounds: acetone, aniline, dimethylaniline. Study of viscosity of unknown liquid with respect to water.
	September	9	12	Aufbau principle and its limitations. Wave mechanics: de Broglie wave equation, Qualitative idea of Heisenberg's Uncertainty Principle. Resonance, resonance energy, steric inhibition of resonance, hyperconjugation, π -M.O diagrams of ethylene, butadiene, 1,3,5- hexatriene, allyl cation, allyl anion, allyl radical.	Preparation secondary standard KMnO4 and Standardization it with oxalic acid. Identification of Pure Organic compounds: benzaldehyde, chloroform, and nitrobenzene. Study of viscosity of unknown liquid with

				Maxwell's distribution of speeds in two and three dimensions, calculations of average, root mean square and most probable values.	respect to water.
	October	6	9	 Radial and Angular distribution curves. Shapes of s, p orbitals. HOMO and LUMO in ground and excited states, orbital pictures of allene, carbene(singlet and triplet), vinyl cyanide, Huckel's rule for aromaticity and antiaromaticity. Graphical comparison of velocity and energy distribution. 	Preparation and standardization of Na ₂ S ₂ O ₃ Identification of a Pure Organic Compound- Solid. Determination of relative surface tension of a liquid using Stalagmometer
	November	6	6	 Radial and Angular distribution curves. Shapes of d orbital, Exchange energy. Frost-diagram, melting point, boiling point, heat of hydrogenation, heat of combustion, hydrogen bonding. Collision of gas molecules; collision diameter; collicion number and mean free path 	Practice. Identification of a Pure Organic Compound- Solid. Practice.
	December	9	12	Classification of elements on the basis of electronic configuration: general characteristics of s-, p-, d- and f-block elements. Positions of hydrogen and noble gases. Crown-ether, concepts of acidity, basicity. Reaction intermediate, carbocation, carbanion, radicals, carbene & stability and generation. Frequency of binary collisions, wall collision and rate of effusion. Viscosity of gases from kinetic theory of gas.	Practice. Identification of unknown Organic Compound. Determination of boiling point of organic liquid. Practice.
SEM 2 (NEP) DS – II (Major)	January	10	13	Arrhenius concept, theory of solvent system, Bronsted-Lowry's concept, relative strength of acids, Pauling's rules.	Estimation of carbonate and hydroxide present together in mixture.
				Representation of molecules in Fischer, flying-	Detection of special elements (N, S, Cl, Br) by

			 wedge, Sawhorse and Newman formula and their translations, chirality, elements of symmetry, simple axis (Cn). Rate law, order and molecularity: Introduction of rate law, Extent of reaction; rate constants, order; Forms of rates of First, second and n-th order reactions; 	Lassaigne's test. Study of kinetics of acid-catalyzed hydrolysis of methyl acetate
February	8	11	Lux-Flood concept Lewis concept, group characteristics of Lewis acids, solvent levelling and differentiating effects.	Estimation of carbonate and bicarbonate present together in a mixture.
			plane of symmetry(σ), centre of symmetry(i), alternating axis of symmetry (Sn), asymmetry and dissymmetry, optical activity, specific rotation, molar rotation, specific rotation of mixture, Biot's	Solubility and classification (Solvents: water, 5% HCl, 5% NaOH, saturated NaHCO3)
			law. Pseudo first order reactions, Determination of order of a reaction by half-life and differential method.	Study of kinetics of decomposition of H2O2
March	9	12	Superacids,.proton affinity; HSAB principle . Stereoisomerism: enantiomerism, diastereoisomerism, stereogenic centre, systems with chiral centres, stereogenic centres involving C=C, C=N, D/L, R/S, E/Z, syn/anti, cis/trans, meso/dl, threo/erythro nomenclature. Role of T and theories of reaction rate: Temperature dependence of rate constant; Arrhenius equation, energy of activation.	Estimation of oxalic acid and sodium oxalate in a given mixture. Detection of the functional groups by systematic chemical tests: Practice
April	9	12	 Acid-base equilibria in aqueous solution pH, buffer Acid-base neutralization curves;. Conformational nomenclature; eclipsed, staggered, gauche and anti, dihedral angle, torsional angle, Klyne-Prelog terminology, energy barrier of rotation. Rate-determining step and steady-state approximation – explanation with suitable examples; Collision theory. 	Practice Detection of the following functional groups by systematic chemical tests: Practice

May	6	7	Solubility product, indicator, choice of indicators. Relative stability of conformers on the basis of steric effect, dipole-dipole interaction, hydrogen bonding, conformational analysis of ethane, propane.	Practice Determination of melting point of the given compound and Identification of the Probable compound.
			outline of Lindemann theory of unimolecular reaction; outline of Transition State theory (classical treatment), Homogeneous catalysis.	Practice
June	3	5	common ion effect and their application in analytical chemistry. Conformational analysis of n-butane, 1,2- dihaloethane, 2-methylbutane, 1.2- glycols,	Practice Practice Practice
			Primary kinetic salt effect; Enzyme catalysis.	

Honours	Month	No of lectures		Topic		
		Theory	Practical	Theory	Practical	
SEM 3 PHYSICAL	July	10	8	Fick's law, Viscosity	Study of viscosity of unknown liquid	
CHEMISTRY II	August	17	16	Conductance and transport number, Partial properties and Chemical potential, Chemical Equilibrium	Determination of partition coefficient	
	September	11	10	Chemical potential and other properties of ideal substances	Determination of Keq for KI+I ₂ =KI ₃	

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	October	6	10	Beginning of Quantum Mechanics	Conductometric titration of an acid
					against strong base
	November	8	8	Wave function, Concept of Operators	Study of saponification reaction
					conductometrically
	December	8	8	Particle in a box, Simple Harmonic Oscillator	Verification of Ostwal's dilution law
SEM 3	July	11	8	Ionic bond: General characteristics	Estimation of Cu(II)
INORGANIC	August	16	18	Covalent bond, Fazan's rules	Estimation of Vitamin C, Estimation of (i)
CHEMISTRV					arsenite and (ii) antimony iodimetrically
	September	10	8	Molecular orbital concept of bonding	Estimation of available chlorine in
11	_				bleaching powder
	October	7	8	Metallic Bond, Semiconductors	Determination of heat of solution of
				and insulators, defects in solids	oxalic acid from solubility measurement
	November	9	10	Weak Chemical Forces, Effects of	Estimation of Cu in brass, Estimation of
				chemical force, melting and boiling points	Cr and Mn in Steel
	December	7	8	Radioactivity	Estimation of Fe in cement
SEM 3	July	13	9	Chemistry of alkenes and alkynes: Addition	Detection of special elements (N, S, Cl,
OPCANIC		_	-	to C=C. Addition to C=C	Br) by Lassaigne"s test
ONGAINIC	August	14	16	Aromatic Substitution: Electrophilic aromatic	Solubility and classification
CHEMISTRY	8			substitution. Nucleophilic aromatic	
III				substitution	
	September	8	11	Carbonyl and Related Compounds:	Detection of the functional groups
	1			Exploitation of acidity of α -H of C=O	
	October	7	6	Elementary ideas of Green Chemistry	Melting point of the given compound
	November	11	9	Nucleophilic addition to α,β -unsaturated	Preparation, purification and melting
				carbonyl system, Substitution at sp^2 carbon	point determination
	December	7	9	Organometallics	Identification of the compound through
		-	-		literature survey
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SEM 4	January	11	10	Colligative properties, Phase rule	Determination of solubility of sparingly
PHYSICAL	5				soluble salt
CHEMICTRY	February	14	14	Binary solutions, Ionic equilibria	Potentiometric titration of Mohr"s salt
CHEMISIKY	March	13	12	Electromotive Force, Dipole moment and	Determination of Ksp for AgCl
III				polarizability	
	April	10	10	Qualitative treatment of hydrogen atom and	Effect of ionic strength on the rate of
	£	-	-	hydrogen-like ions	Persulphate – Iodide reaction
	May	7	8	LCAO and HF-SCF	Study of phenol-water phase diagram
	June	5	6	Angular momentum	pH-metric titration of acid
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SEM 4	January	10	12	General Principles of Metallurgy	Complexometric titration
INORGANIC	February	15	12	Chemistry of <i>s</i> and <i>p</i> Block Elements	Complexometric titration: Zn(II) in a
CHEMISTRV					Zn(II) and Cu(II) mixture
	March	9	10	Noble Gases	Complexometric titration: Ca(II) and
111					Mg(II) in a mixture
	April	11	10	Inorganic Polymers	Complexometric titration: Hardness of
	_				water
	May	8	10	Coordination Chemistry	Inorganic preparations
	June	7	6	Coordination Chemistry	Inorganic preparations
SEM 4	January	12	11	Nitrogen compounds	Estimation of glycine, glucose, sucrose
	February	13	13	Rearrangements	Estimation of vitamin-C
OPCANIC	March	15	14	UV Spectroscopy	Estimation of aromatic amine and phenol
ONGAINIC	April	9	9	IR Spectroscopy	Estimation of formaldehyde and acetic
CHEWISIKY	-				acid
IV	May	6	7	NMR Spectroscopy	Estimation of urea
	June	5	6	The Logic of Organic Synthesis	Estimation of saponification value

SKILL ENHANCEMENT COURSE (3rd AND 4TH SEM)

	Month	No of lectures		Торіс		
		Theory	Practical	Theory	Practical	
Semester 3	July	5	5	Introduction to Analytical Chemistry	Estimation of Calcium and	
Basic Analytical				and its interdisciplinary nature	Magnesium ions as Calcium	
Chemistry					carbonate by complexometric	
					titration, Determination of pH,	

					acidity and alkalinity of a water
	August	6	6	Analysis of soil, Composition of soil, Concept of pH and pH measurement, Complexometric titrations, Chelation, Chelating agents	Identification of adulterants in some common food items like coffee powder, chilli powder, turmeric powder
	Septembe r	4	4	Analysis of food products, Nutritional value of foods	Paper chromatographic separation of mixture of metal ion (Fe ³⁺ and Al ³⁺ , Analysis of deodorants and antiperspirants
	October	4	4	Idea about food processing and food preservations, adulteration	Determination of ion exchange capacity of anion / cation exchange resin
	Novembe r	6	6	General introduction on principles of chromatography, paper chromatography, TLC	Spectrophotometric determination of Iron in Vitamin / Dietary Tablets, Spectrophotometric Identification and Determination of Caffeine and Benzoic Acid in Soft Drinks
	Decembe r	5	5	Ion-exchange chromatography	Estimation of macro nutrients: Potassium, Calcium, Magnesium in soil samples by flame photometry
Semester 4 Analytical Clinical Biochemistry	January	5	5	<i>Carbohydrates:</i> Biological importance of carbohydrates, Metabolism, Cellular currency of energy (ATP), Glycolysis, Alcoholic and Lactic acid fermentations, Krebs cycle. Isolation and characterization of polysachharides.	Identification and estimation of Carbohydrates – qualitative and quantitative
	February	6	6	<i>Proteins:</i> Classification, biological importance; Primary and secondary	Identification and estimation of Lipids – qualitative

March 4 4 Structures of proteins: α-helix and β-pleated sheets, Isolation, characterization, denaturation of proteins. Identification and estimation of cholesterol using Liebermann-Biological roles of DNA (Watson-Crick model) and RNA, Genetic Code, Biological roles of DNA and RNA: Replication, Transcription and Translation, Introduction to Gene therapy. Identification and estimation of Proteins - qualitative April 4 4 Enzymes: Nomenclature, classification, Transcription and Translation, Introduction to Gene therapy. Identification and estimation of Proteins - qualitative May 6 6 Biochemistry of disease, Composition and functions of blood, blood coagulation. Blood collection and preservation of samples. Anaemia, Regulation Determination of the iodine number of oil Honours Month No electures Cordination of constituents of normal and pathological urine. Composition and estimation of constituents of normal and pathological urine. Topic Determination of the iodine number of oil SEM 5 July 10 10 Coordination Chemistry of a configurations in occabedral, square planar and transdring of a configuration in occabedral, square planar and transdring of a configuration in occabedral, square planar and transdring of a configuration in occabedral, square planar and transdring of a configuration in occabedral, square planar and transdring of a configuration in occabedral, square planar and transdring of a configuration in occabedral, square planar and transdrin of constituents of normal and pathological urine. <th>-</th> <th></th> <th>1</th> <th></th> <th></th> <th></th>	-		1			
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				distortion. Octahedral site stabilization energy (OSSE).	
	August	10	20	Metalligand bonding (MO concept, elementary idea), sigma- and pi-bonding in octahedral complexes (qualitative pictorial approach) and their effects on the oxidation states of transitional metals (examples). Magnetism and Colour: Orbital and spin magnetic moments.	Gravimetry
	September	11	10	Spin only moments of d" ions and their correlation with effective magnetic moments, including orbital contribution; quenching of magnetic moment: super exchange and antiferromagnetic interactions (elementary idea with examples only); d-d transitions: L-S coupling:	Gravimetry
	October	6	6	Qualitative Orgel diagrams for 3d' to 3d ions. Racah parameter. Selection rules for electronic spectral transitions:	Gravimetry
	November	6	5	Spectrochemical series of ligands; charge transfer spectra (elementary idea).	Spectrphotometry
	December	10	5	 Transition Elements: General comparison of 3d, 4d and 5d elements in term of electronic configuration, oxidation states, redox properties, coordination chemistry. Lanthanoids and Actinoids: General Comparison on Electronic configuration, oxidation states, colour, spectral and magnetic properties, lanthanide contraction, separation of lanthanides (ion-exchange method only). 	Spectrphotometry
SEM 5 ORGANIC	July	6	10	Polynuclear hydrocarbons and their derivatives: Synthetic methods and reactions	Spectroscopic Analysis of Organic Compounds by assignment of peaks in ¹ H NMR spectra
CHENIISIKY	August	10	10	Heterocyclic Chemistry: Synthesis and	Spectroscopic Analysis of Organic

V				reactivity.	Compounds by assignment of peaks in IR Spectra
	September	10	10	Cyclic Stereochemistry	TLC separation of a mixture containing 2/3 amino acids, TLC separation of a mixture of dyes (fluorescein and methylene blue)
	October	8	10	Pericyclic Reactions: Mechanism, stereochemistry, regioselectivity in case of Electrocyclic, Cycloaddition and Sigmatropic reactions.	Column chromatographic separation of mixture of dyes
	November	14	10	Carbohydrates: Monosaccharides, Disaccharides and Polysaccharides	Paper chromatographic separation of a mixture containing 2/3 amino acids
	December	12	8	Biomolecules: Amino acids, Peptides and Nucleic acids	Paper chromatographic separation of a mixture containing 2/3 sugars
SEM 5 ADVANCED	July	12	3	Bravais Lattice and Laws of Crystallography, Crystal planes, Determination of crystal structure	Roots of equations: (e.g. volume of van der Waals gas and comparison with ideal gas, pH of a weak acid)
CHEMISTRY	August	14	3	Statistical Thermodynamics: Configuration, Boltzmann distribution	Roots of equations: (e.g. volume of van der Waals gas and comparison with ideal gas, pH of a weak acid)
	September	8	3	Partition function : molecular partition function and thermodynamic properties (U, H, S, CV, q, P);Gibbs' paradox; Ideal gas equation	Numerical differentiation (e.g., change in pressure for small change in volume of a van der Waals gas, potentiometric titrations)
	October	7	3	Specific heat of solid, Adiabatic demagnetization	Numerical differentiation (e.g., change in pressure for small change in volume of a van der Waals gas, potentiometric titrations)
	November	10	3	Polymers : Classification of polymers, nomenclature, Molecular forces and chemical bonding in polymers, Criteria for synthetic polymer formation;	Matrix operations (Application of Gauss- Siedel method in colourimetry)
	December	7	3	Polymers:Relationshipsbetweenfunctionality, extent of reaction and degree of polymerization;mechanism and kinetics of step growth and copolymerization; Conducting polymers	Matrix operations (Application of Gauss- Siedel method in colourimetry)

SEM 5	July	12	9	Qualitative and quantitative aspects of analysis	Separation of mixtures
Methods in	August	13	16	Optical methods of analysis: Origin of spectra, validity of Beer-Lambert's law, UV-	Separation of mixtures
Chemistry				Visible Spectrometry, Flame Atomic Absorption and Emission Spectrometry	
	September	8	10	Thermal methods of analysis	Solvent Extractions
	October	7	6	Electroanalytical methods	Solvent Extractions
	November	12	8	Separation techniques: Solvent extraction, aspects of chromatographic methods of analysis: IC, GLC, GPC, TLC	Spectrophotometry
	December	7	9	Stereoisomeric separation and analysis: Measurement of optical rotation, calculation of Enantiomeric excess (ee)/ diastereomeric excess (de) ratios and determination of enantiomeric composition using NMR, Chiral solvents and chiral shift reagents. Chiral chromatographic techniques using chiral columns (GC and HPLC).	Spectrophotometry
SEM 6 INORGANIC CHEMISTRY V	January	12	10	Bioinorganic Chemistry: Elements of life: essential and beneficial elements, major, trace and ultratrace elements. Basic chemical icactions in the biological systems and the role of metal ions (specially*, K*, Mg, Ca, Fe, Cu, and Zno). Metal ion transport across biologica membrane Na K*-ion pump. Dioxygen molecule in life. Dioxygen management proteins: Haemoglobin, Myoglobin. Hemocyanine and Hemerythrin Electron transfer proteins: Cytochromes and Feiredoxins.).	All test of Acid Radicals
	February	12	10	Bioinorganic Chemistry: Hydrlytic enzymas: carbonate bicarbonate buffering system and carbonic anlıydrase and carboxyanhydrase A. Biological nitrogen fixation, Photosynthesis: Photosystem-I and Photosystem-II. Toxic inctal ions and thcir	All test of Basic Radicals

			effects, chelation therapy (examples only). Pt and Au complexes as drugs (examples only), metal dependent diseases (examples only)	
March	12	12	Organometallic Chemistry: Definition and classification of organometallic compounds on the basis of bond type. Concept of laplicily of organic liyancs. 18-election and 16-clection tulos (picional MO approach). Applications of 18- clectron rule to metal carbonyls, nitrosyls, cyanides. Gencral methods of preparation of mono and binuclear carbonyls of 3d scrics. Structures of mononuclear and binuclear carbonyls, pi-acceptor behaviour of CO, synergic effect and use of R data to explain extent of back bonding.	Test for insoluble and Analysis of Unknown sample
April	10	10	Organometallic Chemistry: Zeise's salt: Preparation, structure, evidences of synergic effect. Ferrocene: Preparation and reactions (acetylation, alkylation. metallation, Mannich Condensation). Reactions of organometallic complexes: substitution, oxidative addition, reductive elimination and insertion reactions. Catalysis by Organometallic Compounds Study of the following industrial processes 1. Alkene hydrogenation (Wilkinson's Catalyst) 2. Hydroformylation 3. Wacker Process 4. Syntheric gasoline (Fischer Tropsch reaction) 5. Zigler-Natta catalysis for olephene polyimlerization.	Analysis of Unknown sample
May	7	5	Reaction Kinetics and Mechanism: Introduction to inorganic reaction mechanisms. Substitution reactions in square planar complexes, Trans- effect and its application in complex syithesis, theories of trans effect. Mechanisin of nucleophilic substitution in square planar	Analysis of Unknown sample

				complexes. Thermodynamic and Kinetic stability. Kinetics of octahedral substitution.	
	June	5	3	Ligand field effects and reaction rates, Mechanisin of substitution in octahedral complexes.	Analysis of Unknown sample
SEM 6 PHYSICAL CHEMISTRY IV	January	12	10	Colloids, Origin of charge and stability, Coagulation and Schultz-Hardy rule, Zeta potential and Stern double layer, Tyndall effect; Electrokinetic phenomena, Micelle formation	Verification of Beer and Lambert"s Law for KMnO ₄ and K ₂ Cr ₂ O ₇ solution
	February	15	10	Surface tension and energy: Capillary rise and surface tension; Work of cohesion and adhesion, spreading of liquid over other surface; Temperature dependence of surface tension	Verification of Beer and Lambert"s Law for KMnO ₄ and K ₂ Cr ₂ O ₇ solution
	March	9	10	Rotation spectroscopy, Vibrational spectroscopy	Study of kinetics of $K_2S_2O_8$ + KI reaction, spectrophotometrically
	April	11	10	Raman spectroscopy, Nuclear Magnetic Resonance (NMR) spectroscopy	Study of kinetics of $K_2S_2O_8$ + KI reaction, spectrophotometrically
	May	11	5	Lambert-Beer"s law: Characteristics of electromagnetic radiation, physical significance of absorption coefficients; Laws of photochemistry	Determination of surface tension of a liquid using Stalagmometer
	June	7	6	Photochemical Processes: Potential energy curves, Frank-Condon principle,Bond dissociation, Decay of excited states by radiative and non-radiative paths; Pre- dissociation; Fluorescence and phosphorescence, Jablonskii diagram	Determination of pH of unknown buffer, spectrophotometrically
SEM 6 GREEN CHEMISTRY	January	6	11	Introduction to Green Chemistry: What is Green Chemistry? Need for Green Chemistry. Goals of Green Chemistry. Limitations/ Obstacles in the pursuit of the goals of Green Chemistry	Preparation and characterization of nanoparticles of gold using tea leaves.
	February	10	10	Principles of Green Chemistry and Designing a Chemical synthesis: Twelve principles of Green Chemistry with	Preparation of biodiesel from vegetable/ waste cooking oil.

March	15	10	their explanations and examples and special emphasis on the following: Designing a Green Synthesis using these principles; Prevention of Waste/ byproducts; maximum incorporation of the materials used in the process into the final products, Atom Economy, calculation of atom economy of the rearrangement, addition, substitution and elimination reactions. Prevention/ minimization of hazardous/ toxic products reducing toxicity. risk = (function) hazard × exposure; waste or pollution prevention hierarchy. Green solvents– supercritical fluids, water as a solvent for organic reactions, ionic liquids, fluorous biphasic solvent, PEG, solventless processes, immobilized solvents. Energy requirements for reactions – alternative sources of energy: use of	Use of molecular model kit to stimulate the reaction to investigate how the atom
			microwaves and ultrasonic energy. Selection of starting materials; avoidance of unnecessary derivatization – careful use of blocking/protecting groups.	 economy can illustrate Green Chemistry. Preparation of propene by two methods can be studied Triethylamine ion + OH- → propene + trimethylpropene + water H₂SO4/Δ 1-propanol propene + water Other types of reactions, like addition, elimination, substitution and rearrangement should also be studied for the calculation of atom economy.
April	7	9	Use of catalytic reagents (wherever possible) in preference to stoichiometric reagents; catalysis and green chemistry, comparison of heterogeneous and homogeneous catalysis, biocatalysis, asymmetric catalysis and photocatalysis.	Benzoin condensation using Thiamine Hydrochloride as a catalyst instead of cyanide.

				Prevention of chemical accidents designing greener processes, inherent safer design, principle of ISD "What you don"t have cannot harm you", greener alternative to Bhopal Gas Tragedy (safer route to carcarbaryl) and Flixiborough accident (safer route to cyclohexanol) subdivision of ISD, minimization, simplification, substitution, moderation and limitation. Strengthening/ development of analytical techniques to prevent and minimize the generation of hazardous substances in chemical processes.	
	May	8	7	 Examples of Green Synthesis/ Reactions and some real world cases: 1. Green Synthesis of the following compounds: adipic acid, catechol, disodium iminodiacetate (alternative to Strecker synthesis) 2. Microwave assisted reactions in water: 3. Ultrasound assisted reactions 4. Surfactants for carbon dioxide – replacing smog producing and ozone depleting solvents with CO₂ for precision cleaning and dry cleaning of garments. 	Extraction of D-limonene from orange peel using liquid CO ₂ prepared form dry ice. Mechanochemical solvent free synthesis of azomethines
	June	5	6	 5. Designing of Environmentally safe marine antifoulant. 6. Rightfit pigment: synthetic azopigments to replace toxic organic and inorganic pigments. 7. An efficient, green synthesis of a compostable and widely applicable plastic (polylactic acid) made from corn. 8. Healthier Fats and oil by Green Chemistry: Enzymatic Inter esterification for production of no Trans-Fats and Oils 	Solvent free, microwave assisted one pot synthesis of phthalocyanine complex of copper (II). Photoreduction of benzophenone to benzopinacol in the presence of sunlight.

				9. Development of Fully Recyclable Carpet	
SEM 6 Polymer Chemistry	January	12	11	Introduction and history of polymeric materials: Different schemes of classification of polymers, Polymer nomenclature, Molecular forces and chemical bonding in polymersFunctionality and its importance: for synthetic polymer formation, classification of polymerization processes, 	Preparation of nylon 66
	February	13	13	Kinetics of Polymerization: Kinetics of step growth, radical chain growth, polymerization techniques Nature and structure of polymers: Structure Property relationships	Preparation of nylon 66
	March	15	14	Determination of molecular weight of polymers: (<i>Mn</i> , <i>Mw</i> , etc) by viscometric methods, Molecular weight distribution and its significance. Polydispersity index.	Preparation of urea-formaldehyde resin
	April	9	9	Polymer Solution: Criteria for polymer solubility. Solubility parameter.	Preparation of urea-formaldehyde resin
	May	6	7	Properties of Polymers : Brief introduction to preparation, structure, properties and application of the following polymers: polyolefins, polystyrene, poly(vinyl chloride), poly(vinyl acetate).	Preparations of novalac resin
	June	5	6	Properties of Polymers : Brief introduction to preparation, structure, properties and application of the following polymers: acrylic polymers, fluoropolymers, polyamides, Phenol formaldehyde resins (Bakelite, Novalac), polyurethanes, silicone polymers. Conducting Polymers.	Preparations of novalac resin