

T.S. Negi Govt. College Reckong Peo, Distt. Kinnaur (H.P)

Department of Chemistry

Lecture Plan/Teaching Plan

Name of Faculty: Ms. Anchala

Subject: Chemistry

Class: B.Sc 1st year

Course Code: CHEM101TH

Course Title: Atomic Structure, Bonding, General Organic Chemistry & Aliphatic Hydrocarbons.

Section	Week wise distribution	Topics to be covered	Method of teaching	Assessment	Remarks
Section A Atomic Structure	August (4 weeks)	Review of Bohr's theory and its limitations, dual behavior of matter and radiation, de Broglie's relation, Heisenberg Uncertainty principle. Hydrogen atom spectra. Need of a new approach to Atomic structure. Schrodinger wave equation and meaning of various terms in it. Significance of ψ and ψ^2 . Significance of quantum numbers, Shapes of s, p and d atomic orbitals, nodal planes. Slater rules and applications.	Group discussion	Presentation by students	Assignments for CCA on the topics to individual students
Section B Chemical Bonding and Molecular Structure Ionic Bonding Covalent bonding.	September (4weeks) October (2weeks)	General characteristics of ionic bonding. Energy considerations in ionic bonding, lattice energy and solvation energy and their importance in the context of stability and solubility of ionic compounds. Fajan's rules, ionic character in covalent compounds, bond moment, dipole moment and percentage ionic character. Shapes of some inorganic molecules and ions on the basis of VSEPR and hybridization with suitable examples Rules for the LCAO method, bonding and antibonding MOs etc.	Basics of the topics through lecture and PPT method	Practice questions in class for revision and in depth understanding	Assignments for CCA on the topics to individual students and compulsory library consultation on allotted week day.
Section C Fundamentals of Organic Chemistry	October (2weeks)	Physical Effects, Electronic Displacements: Inductive Effect, Electromeric Effect, Resonance and Hyperconjugation. Cleavage of Bonds: Homolysis and Heterolysis. Conformations with respect to ethane, butane and cyclohexane. Interconversion of Wedge Formula,	Lecture and PPT by faculty members Notes given to the students	Weekly online/offline test	Questions for practice through whatsapp group

Stereochemistry	November (4weeks)	Newman, Sawhorse and Fischer projections. Concept of chirality. Configuration: Geometrical and Optical Isomerism; Enantiomerism, Diastereomerism and Meso compounds). Threo and erythro; D and L; cis - trans nomenclature; CIP Rules: R/ S and E / Z Nomenclature			
Section D Aliphatic Hydrocarbons	February (4weeks)	Functional group approach for the following reactions. Alkanes: (Upto 5 Carbons).Preparation:Catalytic hydrogenation, Wurtz reaction, Kolbe's synthesis, from Grignard reagent.Dehydration of alkenes and dehydrohalogenation of alkyl halides (Saytzeff's rule); cis alkenes (Partial catalytic hydrogenation) and trans alkenes (Birch reduction). Hydroborationoxidation. Alkynes:Reactions: Formation of metal acetylides, addition of bromine and alkaline KMnO ₄ , ozonolysis.	Lecture and demonstration method	Class test in online and offline mode	Class notes to be checked regularly

December Month: Preparation and conduction of house exam.

Teaching/Lecture Plan

Name of Faculty: Mr. Anil Singh Negi

Subject: Chemistry

Class: B.Sc 1st year

Course Code: CHEM102TH

Course Title: States of matter, chemical kinetics and functional organic chemistry

Section	Week wise distribution	Topics to be covered	Method of teaching	Assessment	Remarks
Section C Functional group approach for the following reactions	August (4 weeks) September (2weeks)	Functional group approach for the following reactions (preparations & reactions) to be studied in context to their structure. Aromatic hydrocarbons Preparation (Case benzene): from phenol, by decarboxylation, from acetylene, from benzene sulphonic acid. Reactions: (Case benzene): Electrophilic substitution: nitration, halogenation and sulphonation. Friedel-Craft's reaction (alkylation and acylation) (upto 4 carbons on benzene). Side chain oxidation of alkyl benzenes (upto 4 carbons on benzene). Alkyl Halides (Upto 5 Carbons) Types of Nucleophilic Substitution (SN ₁ , SN ₂ and SN _i) reactions. Preparation: from alkenes and alcohols.	Lecture and PPT by faculty members Notes given to the students	Weekly online/offline test	Questions for practice through whatsapp group

	(2weeks)	and ketones. Aldol Condensation, Cannizzaro's reaction, Wittig reaction, Benzoin condensation. Clemensen reduction and Wolff Kishner reduction. Meerwein-Ponndorf-Verley reduction			
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December Month: Preparation and conduction of house exam.

Teaching plan / Lecture Plan Name of Faculty: Ms. Anchala

Subject: Chemistry Class: B.Sc 2nd year Course Code: CHEM201TH

Course name: Solutions, Phase equilibrium, conductance, electrochemistry and Organic Chemistry.

Section	Week wise distribution	Topics to be covered	Method of teaching	Assessment	Remarks
Section A Solutions	August (4weeks)	Vapour pressure-composition and temperature composition curves of ideal and non-ideal solutions. Distillation of solutions. Lever rule. Azeotropes. Partial miscibility of liquids: Critical solution temperature; effect of impurity on partial miscibility of liquids. Nernst distribution law and its applications, solvent extraction.	Lecture and PPT by faculty members Notes given to the students	Weekly online/offline test	Questions for practice through whatsapp group
Phase equilibrium	September (2weeks)	Phases, components and degrees of freedom of a system, criteria of phase equilibrium. Gibbs Phase Rule and its thermodynamic derivation. Derivation of Clausius – Clapeyron equation and its importance in phase equilibria. Phase diagrams of one-component systems and two component systems involving eutectics, congruent and incongruent melting points.			
Section B Conductance	September (2weeks)	Conductivity, equivalent and molar conductivity and their variation with dilution for weak and strong electrolytes. Kohlrausch law of independent migration of ions. Transference number & Ionic mobility, determination of degree of ionization of weak electrolyte, ionic product of water, hydrolysis constant of a salt. Conductometric titrations. Reversible and irreversible cells. Concept of EMF of a cell.	Lecture and demonstration method	Class test in online and offline mode	Class notes to be checked regularly

Electrochemistry	October (2weeks)	Measurement of EMF of a cell. Nernst equations. Types of electrodes. Standard electrode potential. Electrochemical series. Thermodynamics of a reversible cell, calculation of thermodynamic properties: ΔG , ΔH and ΔS from EMF data etc.			
Section C Functional group approach for the following reactions	October (2weeks) November (4weeks)	(preparations & reactions) to be studied in context to their structure. Carboxylic acids (aliphatic and aromatic) - Preparation: Acidic and Alkaline hydrolysis of esters. Reactions: Hell – Vohlard - Zelinsky Reaction. Carboxylic acid derivatives (aliphatic): (Upto 5 carbons) - Preparation: Acid chlorides, Anhydrides, Esters and Amides from acids and their inter conversion. Reactions: Comparative study of nucleophilicity of acyl derivatives. Reformatsky Reaction, Perkin condensation. Amines Preparation: from alkyl halides, Gabriel's Phthalimide synthesis, Hofmann Bromamide reaction etc	Group discussion	Presentation by students	Assignments for CCA on the topics to individual students
Section D Carbohydrates	February (4weeks)	Classification, and General Properties, Glucose and Fructose (open chain and cyclic structure), Determination of configuration of monosaccharides, absolute configuration of Glucose and Fructose, Mutarotation, ascending and descending in monosaccharide. Structure of disaccharides (sucrose, maltose, lactose) and polysaccharides (starch and cellulose) excluding their structure elucidation.	Basics of the topics through lecture and PPT method	Practice questions in class for revision and in depth understanding	Assignments for CCA on the topics to individual students and compulsory library consultation on allotted week day.

December Month: Preparation and conduction of house exam.

Teaching /Lecture Plan

Name of Faculty: Ms. Anchala

Subject: Chemistry

Class: B.Sc 2nd year

Course Code: CHEM202TH

Course name: CHEMISTRY OF MAIN GROUP ELEMENTS, CHEMICAL ENERGETICS AND EQUILIBRIA

Section	Week wise distribution	Topics to be covered	Method of teaching	Assessment	Remarks
Section A		Unique position of Hydrogen in the periodic table, isotopes, ortho and para hydrogen, Industrial production,	Basics of the topics through	Practice questions in class for	Assignments for CCA on the

Hydrogen	August (2weeks)	Hydrides and their chemistry, Heavy water, Hydrogen bonding, Hydrates.	lecture and PPT method	revision and in depth understanding	topics to individual students and compulsory library consultation on allotted week day.
S-block elements	August (2weeks)	Periodicity of elements with respect to electronic configuration, atomic and ionic size, ionization enthalpy, electron gain enthalpy, electronegativity(Pauling Scale). General characteristics of s-block elements like density, melting points.General characteristics of s-block elements ,flame colouration and reducing character, solvation and complexation tendencies and solutions of metals in liquid ammonia.			
Section B P-block elements	Septmeber (4weeks)	Comparative studies including diagonal relationship of group 13 and 14 elements. Borohydrides, Hydrides, oxide and oxy-acids and halides of boron, borax, Borazine ,allotropic forms of carbon, fullerenes, carbides of calcium and silicon. Hydrides, oxides, oxoacids and halides of nitrogen. Allotropic forms of phosphorous. Hydrides, halides, oxides and oxyacids of phosphorous. Basic properties of halogens and inter halogen compounds, pseudohalogens and poly halides.	Lecture and PPT by faculty members Notes given to the students	Weekly online/offline test	Questions for practice through whatsapp group
Noble Gases	October (2weeks)	Occurrence of noble gases, History of discovery of noble gases and isolation of noble gases form air. Preparation properties and structure of important compounds of noble gases-flourides, oxides, oxyflorides of xenon etc.			
Section D Chemical equilibrium	October (2weeks)	Free energy change in a chemical reaction. Thermodynamic derivation of the law of chemical equilibrium. Distinction between ΔG and ΔG_o , Le Chatelier's principle. Relationships between K_p , K_c and K_x for reactions involving ideal gases.	Basics of the topics through lecture and PPT method	Practice questions in class for revision and in depth understanding	Assignment s for CCA on the topics to individual students
Ionic equilibria	November (4weeks)	Strong, moderate and weak electrolytes, degree of ionization, factors affecting degree of ionization, ionization constant and ionic product of water. Ionization of weak acids and bases, pH scale, common ion effect.			

Section C Chemical energetic	February (4weeks)	Review of thermodynamics and the Laws of Thermodynamics. Important principles and definitions of thermochemistry. Concept of standard state and standard enthalpies of formations, integral and differential enthalpies of solution and dilution. Calculation of bond energy, bond dissociation energy and resonance energy from thermochemical data. Variation of enthalpy of a reaction with temperature – Kirchoff's equation. Statement of Third Law of thermodynamics and calculation of absolute entropies of substances.	Lecture and demonstration method	Practice questions in class for revision and in depth understanding	Class notes to be checked regularly
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December Month: Preparation and conduction of house exam.

Teaching plan /Lecture Plan **Name of Faculty: Ms. Anchala**

Subject: Chemistry **Class: B.Sc 2nd year** **Course Code: CHEM203TH**

Course name: BASIC ANALYTICAL CHEMISTRY

Section	Week wise distribution	Topics to be covered	Method of teaching	Assessment	Remarks
Section A Introduction to Analytical Chemistry Analysis of soil	August (4weeks) September (2weeks)	Introduction to Analytical Chemistry and its interdisciplinary nature. Concept of sampling. Importance of accuracy, precision and sources of error in analytical measurements. Presentation of experimental data and results, from the point of view of significant figures. Composition of soil, Concept of pH and pH measurement, Complexometric titrations, Chelation, Chelating agents, use of indicators. a. Determination of pH of soil samples. b. Estimation of Calcium and Magnesium ions as Calcium carbonate by complexometric titration.	Basics of the topics through lecture	Practice questions in class for revision and in depth understanding	Class notes to be checked regularly
Section B Analysis of water	Septembeer (2weeks)	Definition of pure water, sources responsible for contaminating water, water sampling methods, water purification methods. a. Determination of pH, acidity and alkalinity of a water sample. b. Determination of dissolved oxygen (DO) of a water sample. Nutritional value of foods, idea about food processing and food preservations	Lecture and demonstration method and PPT.	Practice questions in class for revision and in depth understanding	Assignments for CCA on the topics to individual students

Analysis of food products	October (4weeks)	and adulteration. a. Identification of adulterants in some common food items like coffee powder, asafoetida, chilli powder, turmeric powder, coriander powder and pulses, etc. b. Analysis of preservatives and colouring matter.			
Section C Chromatography	November (4weeks)	Definition, general introduction on principles of chromatography, paper chromatography, TLC etc. a. Paper chromatographic separation of mixture of metal ion (Fe^{3+} and Al^{3+}). b. To compare paint samples by TLC method. Ion-exchange: Column, ion-exchange chromatography etc. Determination of ion exchange capacity of anion / cation exchange resin (using batch procedure if use of column is not feasible).	Lecture and demonstration method	Weekly online/offline test	Questions for practice through whatsapp group
Section D Analysis of cosmetics	February (4weeks)	Analysis of cosmetics: Major and minor constituents and their function a. Analysis of deodorants and antiperspirants, Al, Zn, boric acid, chloride, sulphate. b. Determination of constituents of talcum powder: Magnesium oxide, Calcium oxide, Zinc oxide and Calcium carbonate by complexometric titration.	Basics of the topics through lecture and PPT method	Practice questions in class for revision and in depth understanding	Assignments for CCA on the topics to individual students

December Month: Preparation and conduction of house exam.

Teaching plan/Lecture Plan

Name of Faculty: Ms. Anchala

Subject: Chemistry

Class: B.Sc 2nd year

Course Code: CHEM204TH

Course name: FUEL CHEMISTRY & CHEMISTRY OF COSMETICS & PERFUMES

Section	Week wise distribution	Topics to be covered	Method of teaching	Assessment	Remarks
Section A Review of energy sources (renewable and non-renewable)	August (4weeks) Septmeber (2 weeks)	Classification of fuels and their calorific value. Coal: Uses of coal (fuel and nonfuel) in various industries, its composition, carbonization of coal. Coal gas, producer gas and water gas—composition and uses. Fractionation of coal tar, uses of coal tar bases chemicals, requisites of a good metallurgical coke, Coal gasification (Hydro gasification and Catalytic gasification), Coal liquefaction and	Basics of the topics through lecture	Practice questions in class for revision and in depth understanding	Class notes to be checked regularly

		Solvent Refining. Petroleum and Petrochemical Industry: Composition of crude petroleum, Refining and different types of petroleum products and their applications.			
Section B	October (4weeks)	Fractional Distillation (Principle and process), Cracking (Thermal and catalytic cracking), Reforming Petroleum and non-petroleum fuels (LPG, CNG, LNG, bio-gas, fuels derived from biomass), fuel from waste, synthetic fuels (gaseous and liquids), clean fuels. Petrochemicals: Vinyl acetate, Propylene oxide, Isoprene, Butadiene, Toluene and its derivatives Xylene. Classification of lubricants, lubricating oils (conducting and non-conducting) Solid and semisolid lubricants, synthetic lubricants. Properties of lubricants (viscosity index, cloud point, pore point) and their determination.	Lecture and demonstration method and PPT.	Practice questions in class for revision and in depth understanding	Assignments for CCA on the topics to individual students and compulsory library consultation on allotted week day.
Lubricants	Septmeber (2weeks)				
Section D	November (4weeks)	Essential oils and their importance in cosmetic industries with reference to Eugenol, Geraniol, sandalwood oil, eucalyptus, rose oil, 2-phenyl ethyl alcohol, Jasmine, Civetone, Muscone.	Basics of the topics through lecture and PPT method	Practice questions in class for revision and in depth understanding	Assignments for CCA on the topics to individual students
Section C	February (4weeks)	A general study including preparation and uses of the following: Hair dye, hair spray, shampoo, suntan lotions, face powder, lipsticks, talcum powder, nail enamel, creams (cold, vanishing and shaving creams), antiperspirants and artificial flavours.			

December Month: Preparation and conduction of house exam.

Teaching plan/ Lecture Plan Name of Faculty: Mr. Anil Singh Negi

Subject: Chemistry Class: B.Sc 3rd year Course Code: CHEM301TH

Course name: POLYNUCLEAR HYDROCARBONS, DYES, HETEROCYCLIC COMPOUNDS AND SPECTROSCOPY (UV, IR, NMR)

Section	Week wise distribution	Topics to be covered	Method of teaching	Assessment	Remarks
Section A Polynuclear Hydrocarbons	August (2weeks)	Synthesis & reactions of Naphthalene, Anthracene & Phenanthrene. Relative reactivity of these compounds at various positions.	Basics of the topics through lecture and PPT method	Practice questions in class for revision and in depth	Assignments for CCA on the topics to individual

Synthetic dyes	August (2weeks)	Colour and constitution [electronic concept], classification of dyes. Chemistry and synthesis of methyl orange, congo red, malachite green, crystal violet, phenolphthalein, fluorescein, alizarin and indigo.		understanding	students
Section B Heterocyclic compounds	Septmeber (2weeks) Septmeber (2weeks)	Classification and nomenclature, Molecular orbital picture & aromatic characteristics of pyrrole, furan, thiophene & pyridine. Methods of synthesis, chemical reactions with emphasis on mechanism of electrophilic substitution. Mechanism of nucleophilic substitution reactions in pyridine. comparison of basicity of pyridine, piperidine and pyrrole. Introduction to condensed five & six-membered heterocyclic compounds, preparation & reactions of indole quinoline & isoquinoline with special reference to Fisher indole synthesis Skraup synthesis & Bischler – Napieralski synthesis. Mechanism of electrophilic substitution reactions of indole, quinoline, & isoquinoline .	Lecture and demonstratio n method	Weekly online/offline test	Questions for practice through whatsapp group
Section C Application of UV and IR Spectroscopy to Simple Organic Molecules	October (4weeks) November (2weeks)	Application of visible, ultraviolet and Infrared spectroscopy in organic molecules. Electromagnetic radiations, electronic transitions, λ_{max} . & ϵ_{max} . chromophore,auxochrome,bathochromic and hypsochromic shifts. Application of electronic spectroscopy and Woodward rules for calculating λ_{max} . of conjugated dienes and α , β – unsaturated compounds. Infrared radiation and types of molecular vibrations, functional group and fingerprint region. IR spectra of alkanes, alkenes and simple alcohols (inter and intramolecular hydrogen bonding), aldehydes, ketones, carboxylic acids and their derivatives (effect of substitution on $>C=O$ stretching absorptions).	Group discussion	Presentation by students	Assignment s for CCA on the topics to individual students
Section D Nuclear Magnetic Resonance	November (2weeks)	Principle of nuclear magnetic resonance, number of signals, peak areas equivalent & non-equivalent protons, positions of signals, chemical shift. Shielding & deshielding of protons, proton counting, splitting of	Lecture and demonstratio n method and PPT.	Practice questions in class for revision and in depth understanding	Assignment s for CCA on the topics to individual students and

Spectroscopy	February (4weeks)	signals & coupling constants, magnetic equivalence of protons. Discussion of PMR spectra of molecules : ethyl bromide, n propyl bromide, isopropyl bromide 1,1-dibromoethane 1,1,2-tribromo ethane, ethanol, toluene, acetaldehyde, acetophenone. Simple problems on PMR spectroscopy for structure determination of organic compounds.		compulsory library consultation on allotted week day.
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December Month: Preparation and conduction of house exam.

Teaching plan/Lecture Plan Name of Faculty: Mr. Anil Singh Negi

Subject: Chemistry Class: B.Sc 3rd year Course Code: CHEM305TH

Course name: POLYMER CHEMISTRY

Section	Week wise distribution	Topics to be covered	Method of teaching	Assessment	Remarks
Section A Introduction and history of polymeric materials	August (4weeks) Septmeber (2weeks)	Different schemes of classification of polymers, Polymer nomenclature, Molecular forces and chemical bonding in polymers, Texture of Polymers. Functionality and its importance: Criteria for synthetic polymer formation, classification of polymerization processes, Relationships between functionality, extent of reaction and degree of polymerization. Bi functional systems, Poly-functional systems.	Basics of the topics through lecture	Practice questions in class for revision and in depth understanding	Class notes to be checked regularly
Section B Kinetics of Polymerization Crystallization and crystallinity	Septmeber (2weeks) October (2weeks)	Mechanism and kinetics of step growth, radical chain growth, ionic chain (both cationic and anionic) and coordination polymerizations, Mechanism and kinetics of copolymerization, polymerization techniques. Determination of crystalline melting point and degree of crystallinity, Morphology of crystalline polymers, Factors affecting crystalline melting point. Nature and structure of polymers-Structure Property relationships.	Lecture and demonstration method and PPT.	Practice questions in class for revision and in depth understanding	Assignments for CCA on the topics to individual students and compulsory library consultation on allotted week day.

Section C Determination of molecular weight of polymers	November (4weeks)	End group analysis, viscometry, light scattering and osmotic pressure methods. Molecular weight distribution and its significance. Polydispersity index. Glass transition temperature (T _g) and determination of T _g , Free volume theory, WLF equation, Factors affecting glass transition temperature (T _g).	Lecture and demonstration method	Weekly online/offline test	Questions for practice through whatsapp group
Polymer Solution	October (2weeks)	Criteria for polymer solubility, Solubility parameter, Thermodynamics of polymer solutions, entropy, enthalpy, and free energy change of mixing of polymers solutions, Flory-Huggins theory, Lower and Upper critical solution temperatures.			
Section D Properties of Polymers (Physical, thermal, Flow & Mechanical Properties)	February (4weeks)	Brief introduction to preparation, structure, properties and application of the following polymers: polyolefins, polystyrene and styrene copolymers, poly(vinyl chloride) and related polymers, poly(vinyl acetate) and related polymers, acrylic polymers, fluoro polymers, polyamides and related polymers. Phenol formaldehyde resins (Bakelite, Novalac), polyurethanes, silicone polymers, polydienes, Polycarbonates, Conducting Polymers, [polyacetylene, polyaniline, poly(p-phenylene sulphide polypyrrole, polythiophene)].	Basics of the topics through lecture and PPT method	Practice questions in class for revision and in depth understanding	Assignments for CCA on the topics to individual students

December Month: Preparation and conduction of house exam.

Teaching plan / Lecture Plan

Name of Faculty: Mr. Anil Singh Negi

Subject: Chemistry

Class: B.Sc 3rd year

Course Code: CHEM307TH

Course name: CHEMICAL TECHNOLOGY & SOCIETY and BUSINESS SKILLS FOR CHEMISTRY

Section	Week wise distribution	Topics to be covered	Method of teaching	Assessment	Remarks
Section A Chemical Technology	August (4weeks)	Basic principles of distillation, solvent extraction, solid-liquid leaching and liquid-liquid extraction, separation by absorption and adsorption. An introduction into the scope of different types of equipment needed in chemical technology, including reactors, distillation columns, extruders, pumps,	Basics of the topics through lecture	Practice questions in class for revision and in depth understanding	Class notes to be checked regularly

		mills, emulgators. Scaling up operations in chemical industry. Introduction to clean technology.			
Section B Society	September (4weeks) October (2weeks)	Exploration of societal and technological issues from a chemical perspective. Chemical and scientific literacy as a means to better understand topics like air and water (and the trace materials found in them that are referred to as pollutants); energy from natural sources (i.e. solar and renewable forms), from fossil fuels and from nuclear fission; materials like plastics and polymers and their natural analogues, proteins and nucleic acids, and molecular reactivity and interconversions from simple examples like combustion to complex instances like genetic engineering and the manufacture of drugs.	Lecture and demonstration method and PPT.	Practice questions in class for revision and in depth understanding	Assignments for CCA on the topics to individual students and compulsory library consultation on allotted week day.
Section C Business Basics Key business concepts Chemistry in Industry	October (2weeks) November (2weeks)	Business plans, market need, project management and routes to market. Current challenges and opportunities for the chemistry-using industries, role of chemistry in India and global economies.	Lecture and demonstration method	Weekly online/offline test	Questions for practice through whatsapp group
Section D Making money Intellectual property	November (2weeks) February (2weeks)	Making money Financial aspects of business with case studies Concept of intellectual property, patents.			

December Month: Preparation and conduction of house exam.

Teaching plan /Lecture Plan

Name of Faculty: Mr. Anil Singh Negi

Subject: Chemistry

Class: B.Sc 3rd year

Course Code: CHEM308TH

Course name: PESTICIDE CHEMISTRY & PHARMACEUTICAL CHEMISTRY

Section	Week wise distribution	Topics to be covered	Method of teaching	Assessment	Remarks
Section A General introduction to pesticides(natural and synthetic	August (4weeks)	benefits and adverse effects, changing concepts of pesticides, structure activity relationship.	Basics of the topics through lecture	Practice questions in class for revision and in depth understanding	Class notes to be checked regularly

Section B Synthesis and technical manufacture and uses of representative pesticides	September (4weeks) October (2weeks)	Synthesis and technical manufacture and uses of representative pesticides in the following classes: Organochlorines (DDT,Gammexene,);Organophosphates (Malathion, Parathion); Carbamates (Carbofuran and carbaryl); Quinones (Chloranil), Anilides (Alachlor and Butachlor).	Lecture and demonstration	Practice questions in class for revision and in depth understanding	Assignments for CCA on the topics to individual students
Section C Drugs & Pharmaceuticals Drug	October (2weeks) November (4 weeks)	Discovery, design and development; Basic Retrosynthetic approach. Synthesis of the representative drugs of the following classes: analgesics agents, antipyretic agents, antiinflammatory agents (Aspirin, paracetamol, Ibuprofen); antibiotics (Chloramphenicol); antibacterial and antifungal agents (Sulphonamides; Sulphanethoxazol, Sulphacetamide, Trimethoprim); antiviral agents (Acyclovir), Central Nervous System agents etc.	Lecture and demonstration method	Weekly online/offline test	Questions for practice through whatsapp group
Section D Fermentation Aerobic and anaerobic fermentation	February (4 weeks)	Production of (i) Ethyl alcohol and citric acid, (ii) Antibiotics; Penicillin, Cephalosporin, Chloromycetin and Streptomycin, (iii) Lysine, Glutamic acid, Vitamin B2, Vitamin B12 and Vitamin C.	Basics of the topics through lecture and PPT method	Practice questions in class for revision and in depth understanding	Assignments for CCA on the topics to individual students

December Month: Preparation and conduction of house exam.