D.B.F. Dayanand College of Arts and Science, Solapur

COURSE OUTCOME

Name of Department: Chemistry

B.A. / B.Sc. / M.A. / M.Sc.	: M.Sc. I	
NAME OF SUBJECT	: Inorganic Chemistry	
SEM I / II / III / IV / V / VI	: Sem. I	
COURSE NUMBER (PAPER NUMBER)	: HCP-101	
TITLE OF COURSE (NAME OF PAPER)	**: Inorganic Chemistry**	
COURSE CONTENT	**OBJECTIVES**	**OUTCOME**
Unit-I: Wave Mechanics Origin of quantum theory, black body radiation, atomic spectra, photoelectric effect, matter waves, wave nature of the electron, the wave equation, the particle in one dimensional box, the particle in three dimentional box,the hydrogen atom, transformations of coordinates, separation of variables and their significance, the Φ equation, the Θ equation and the Radial equation.	To study the Origin of quantum theory, black body radiation, atomic spectra, photoelectric effect, To understand the matter waves, wave nature of the electron, the wave equation, To derive the expression for the particle in one dimensional box, the particle in three dimentional box, the hydrogen atom, transformations of coordinates, separation of variables and their significance, the Φ equation, the Θ equation and the Radial equation.	Able to understand the Origin of quantum theory, black body radiation, atomic spectra, photoelectric effect, Understands the matter waves, wave nature of the electron, the wave equation, Able to derive the expression for the particle in one dimensional box, the particle in three dimentional box, the hydrogen atom, transformations of coordinates, separation of variables and their significance, the Φ equation, the Θ equation and the Radial equation.
Unit-II: Chemistry of Transition Elements General characteristic properties of transition elements, co-ordination chemistry oftransition metal ions, ligand field theory, ligand field energy parameters(Racahparameters B and C, Slater Condon Parameters, Slater Condon Shortley Parameters), splitting of d orbitals in low symmetry environment, Janh-Teller effect, interpretationof	1. Enable students to understand characteristic of transition elements 2. To help students to understand various ligand field theories, ligand field parameters 3. To help students to understand d- orbital splitting, john tellar distortion, electromagnetic spectra, magnetism	1. Students understood various characteristic of transition elements 2. Students understood various ligand field theories

electronic spectra including charge transfer spectra, spectrochemical series, nephelauxetic effect and nephelauxetic series. Dia-para-ferro and antiferromagnetism, quenching of orbital angular moments, spin orbit coupling, metal clusters, metal carbonyls.		
Unit-III: A) Stereochemistry and Bonding VSEPR theory, Walsh diagrams (tri and penta-atomic molecules) $d\pi - p\pi$ bonds, Bent`s rule and energetics of hybridization, some simple reactions of covalently bonded molecules.	To get knowledge of structure and bonding in inorganic covalent compounds.	Students understood the, VSEPR theory, Walsh diagram, Bent rule, Hybridization concepts and the structure and bonding in inorganic covalent compounds on the basis of these concepts.
Unit-III: B) Inorganic Materials Insulators and semiconductors, electronic structure of solids, band theory, intrinsic and extrinsic semiconductors, doping of semiconductors and conduction mechanism, semiconductor devices, rectifiers, transistors, photoconductors, photovoltaic cell.	To get knowledge of conduction mechanism in Inorganic materials and their application.	Students understood the, Types of inorganic solids as insulator, semiconductors and conductors. Also they understood the doping of semiconductors and conduction mechanism, semiconductor devices, rectifiers, transistors, photoconductors, photovoltaic cell
Unit-IV: Nuclear Chemistry Radioactive decay and equilibrium, Nuclear reactions, Q values, cross sections, types of reactions. Chemical effects of nuclear transformations, fission and fusion, fission products and fission yields. Radio active techniques, tracer techniques, neutron activation analysis, counting	1. To help the students to understand nuclear reactions 2. To help the students to understand difference between chemical reactions and nuclear reactions 3. To help the students to understand various types of nuclear reactions 4. To help the students to understand applications of nuclear reactions in energy	1. Students understood nuclear reactions, difference between chemical and nuclear reactions 2. Students understood various types of chemical reactions and their beneficial characteristic 3. Students understood application of nuclear reactions

techniques such as G.M., ionization and proportional counters.	production 5. To help the students to understand applications of radioactivity in various fields Enable students to understand various counting techniques	4. Students can apply radioactive techniques in various fields

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M.Sc. I		
NAME OF SUBJECT: Organic Chemistry-I		
SEM I		
COURSE NUMBER (PAPER NUMBER) HCT-102		
TITLE OF COURSE (NAME OF PAPER): Instrumental Methods of Analysis		
COURSE CONTENT	**OBJECTIVES**	
Unit –I **(a) Reaction mechanism: Structure and reactivity (7)** Types of reactions, strength of acids and bases. Generation, structure, stability and reactivity of reaction intermediates: Carbocations, carbanions, free radicals, carbenes, nitrenes, benzynes and ylides. Effect of structure on reactivity: resonance, steric, hyperconjugation effects **(b) Aliphatic Nucleophilic substitutions: (8)** The SN_2, $SN_i$and SN_i with respect to mechanism and stereochemistry. Nucleophilic substitutions at an allylic, aliphatic trigonal, benzylic, aryl and vinylic carbons. Reactivity effect of substrate structure, effect of attacking nucleophiles, leaving groups and reaction medium. SN reactions at bridged head carbon, competition between SN_1 and SN_2, ambident nucleophiles, Neighbouring Group Participation.	**To study,** **Reaction mechanism: Structure and reactivity** Types of reactions, strength of acids and bases. Generation, structure, stability and reactivity of reaction intermediates: Carbocations, carbanions, free radicals, carbenes, nitrenes, benzynes and ylides. Effect of structure on reactivity: resonance, steric, hyperconjugation effects **To study,** **Aliphatic Nucleophilic substitutions** The SN_2, $SN_i$and SN_i with respect to mechanism and stereochemistry. Nucleophilic substitutions at an allylic, aliphatic trigonal, benzylic, aryl and vinylic carbons. Reactivity effect of substrate structure, effect of attacking nucleophiles, leaving groups and reaction medium. SN reactions at bridged head carbon, competition between SN_1 and SN_2, ambident nucleophiles, Neighbouring Group Participation.	**Students got unde** Types of reactions, Generation, structu reaction intermedia free radicals, carbe ylides. Effect of str steric, hyperconjug **Students got unde** The SN_2, $SN_i$and SN stereochemistry. Nu at an allylic, alipha vinylic carbons. Re structure, effect of a groups and reaction bridged head carbo SN_2, ambident nucl Group Participation
Unit - II		

(a) Aromatic Electrophilic Substitutions: Introduction, the arenium ion mechanism, orientation and reactivity in Nitration, Sulphonation, Friedel-Crafts and Halogenation in monosubstituted aromatic systems, energy profile diagrams. The ortho / para ratio, ipso attack, orientation in other ring systems (naphthalene, anthracene, 5 and 6 membered aromatic heterocyclic compounds). Diazo-coupling, Vilsmeir reaction, Gatterman-Koch reaction. Nucleophilic aromatic substitution reactions SN_1 ,$SN_2$and Arynes. **(b) Addition to Carbon–Carbon Multiple Bonds (7)** Mechanism and stereochemical aspects of the addition reactions involving electrophiles, nucleophiles and free radicals, regio-and chemo – selectivity, orientation and reactivity. Hydrogenation of double, triple bonds and aromatic rings. Michael reaction. Sharpless asymmetric epoxidation.	**To study,** Introduction, the arenium ion mechanism, orientation and reactivity in Nitration, Sulphonation, Friedel-Crafts and Halogenation in monosubstituted aromatic systems, energy profile diagrams. The ortho / para ratio, ipso attack, orientation in other ring systems (naphthalene, anthracene, 5 and 6 membered aromatic heterocyclic compounds). Diazo-coupling, Vilsmeir reaction, Gatterman-Koch reaction. Nucleophilic aromatic substitution reactions SN_1 ,$SN_2$and Arynes. **To study,** **Addition to Carbon–Carbon Multiple Bonds** Mechanism and stereochemical aspects of the addition reactions involving electrophiles, nucleophiles and free radicals, regio-and chemo – selectivity, orientation and reactivity. Hydrogenation of double, triple bonds and aromatic rings. Michael reaction. Sharpless asymmetric epoxidation.	**Students got unde** The arenium ion me reactivity in Nitrati Friedel-Crafts and aromatic systems, e The ortho / para rat other ring systems and 6 membered ar Diazo-coupling, Vi Gatterman-Koch re substitution reactio **Students got unde** **Addition to Carbo** Mechanism and ste addition reactions i nucleophiles and fr selectivity, orientat Hydrogenation of d rings. Michael reac asymmetric epoxid
Unit - III **(a) Elimination Reactions:** The E1, E2 and E1cB mechanisms. Orientation in Elimination reactions. Hofman versus Saytzeff elimination. Reactivity: effects of substrate structures , attacking base, the leaving group, the nature of medium on elimination reactions, competition between substitution and elimination reactions, pyrolytic elimination reactions. **(b) Rearrangements:** Study of following rearrangements with mechanism and stereochemistry**:** Beckman, Fries, Hoffman, Schmidt, Curtius ,Lossen, Claisen, Benzilic acid, Wolff, Steven's &Sommelet-	**To study,** **Elimination Reactions** The E1, E2 and E1cB mechanisms. Orientation in Elimination reactions. Hofman versus Saytzeff elimination. Reactivity: effects of substrate structures , attacking base, the leaving group, the nature of medium on elimination reactions, competition between substitution and elimination reactions, pyrolytic elimination reactions. **To study,** **Rearrangements:** Study of following rearrangements with mechanism and stereochemistry**:** Beckman, Fries, Hoffman, Schmidt, Curtius ,Lossen, Claisen, Benzilic acid, Wolff, Steven's &Sommelet-	**Students got unde** **Elimination React** The E1, E2 and E1c Elimination reactio elimination. Reacti structures , attackin nature of medium o competition betwee reactions, pyrolytic **Students got unde** **Rearrangements:** Study of following and stereochemistry Hoffman, Schmidt, Benzilic acid, Wolf Hauser**.**

Hauser**.**	Hauser**.**	
Unit – IV **Stereochemistry:** Isomerism, classification of isomers (constitutional and stereoisomers). Concept of Chirality: Recognition of symmetry elements and chiral structures, Prochiral relationship. Racemic modifications and their resolution. R and S nomenclature. Geometrical isomerism E and Z omenclature., Erythro and Threo nomenclature, Conformational analysis of mono and isubstitutedcyclohexanes (stability and reactivity), representation of conformational isomers.	**To study,** **Stereochemistry:** Isomerism, classification of isomers (constitutional and stereoisomers). Concept of Chirality: Recognition of symmetry elements and chiral structures, Prochiral relationship. Racemic modifications and their resolution. R and S nomenclature. Geometrical isomerism E and Z omenclature., Erythro and Threo nomenclature, Conformational analysis of mono and isubstitutedcyclohexanes (stability and reactivity), representation of conformational isomers.	**Students got unde** **Stereochemistry:** Isomerism, classifi and stereoisomers). Recognition of sym structures, Prochira modifications and t nomenclature. Geo omenclature., Eryth Conformational ana isubstitutedcyclohe representation of co

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M.Sc.I		
NAME OF SUBJECT: Physical Chemistry		
SEM I		
COURSE NUMBER (PAPER NUMBER) HCT-103		
TITLE OF COURSE (NAME OF PAPER): Physical Chemistry-I		
COURSE CONTENT	**OBJECTIVES**	
Chemical Thermodynamics Review of Thermodynamics laws, Derivations of Maxwells Relations, Thermodynamic equation of state, Entropy and Third law of thermodynamics, residual entropy. Concept of fugacity and determination of fugacity, Activity and activity coefficients of solute and solvent, their determination by freezing point depression and vapour pressure measurement, criteria for equilibrium between phases, Derivation of phase rule, application of phase rule to three	To Review of Thermodynamics laws, To derive Maxwells Relations, Thermodynamic equation of state, To study Entropy and Third law of thermodynamics, residual entropy. To know about the fugacity and determination of fugacity, Activity and activity coefficients of solute and solvent, their determination by freezing point depression and vapour pressure measurement, criteria for equilibrium between phases, To derive phase rule and apply it to three component system.	Able to know the T Able to derive Max Thermodynamic eq Understands Entro thermodynamics, r Able to know abou of fugacity, Activi solute and solvent, point depression ar measurement, crite phases, Able to derive pha component system

component system.		
Unit-2B:Fast Reactions: [10] Study of kinetics by stop-flow technique, relaxation method, flash photolysis and magnetic resonance method, pressure jump method. (More stress should be given in solving the numerical problems).	Study of kinetics of stop flow technique, relaxation, flash photolysis method temperature jump, pressure jump methods.	Student should und satisfied. Solve the

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Class: M.Sc. – I
Name of the subject: Chemistry
Sem- I
Course number –I (HCT-104)
TITLE OF THE COURSE: ANALYTICAL CHEMISTRY

COURSE CONTENT	OBJECTIVES	
Electro-analytical Techniques: Polarography and Amperometry: Polarography: - Introduction, Instrumentation, Ilkovic equation and its application in quantitative analysis. Half wave potential. Derivation of wave equation, Determination of half wave potential, qualitative and quantitative applications Amperometry: - Principles, instrumentation, nature of titration curves, analytical applications.	Polarography: - Introduction, Instrumentation, Ilkovic equation and its application in quantitative analysis. Half wave potential. Derivation of wave equation, Determination of half wave potential, qualitative and quantitative applications Amperometry: - Principles, instrumentation, nature of titration curves, analytical applications.	The students can kn Polarography and A
Chromatographic Methods General principles, Classification of Chromatographic methods. Nature of partition forces, Chromatographic behavior of solutes, coloumn efficiency and resolution. Gas Chromatography: Theory and Instrumentation, column types, solid-liquid stationary phases, column switching techniques, basic and specialized detectors. High Performance Liquid Chromatography: Theory and instrumentation, adsorption and	**To study the :** General study of chromatographic techniques Chromatographic behavior of solutes, coloumn efficiency and resolution. Gas Chromatography Theory and Instrumentation, column types, solid-liquid stationary phases, column switching techniques	**Students gain in u** Knowledge of inst techniques Also to study the p instruments Study the industria types, solid-liquid s switching techniques, basic ar

applications.		
Unit – III **(a) Study of Organometallic compounds**: Organo-magnesium, Organo-zinc, Organo-lithium, organo-copper and organo-tin reagents. Addition reactions: Additions to carbonyl and unsaturated carbonyl compounds, Witting reaction. **(b) Methodologies in organic synthesis:** Ideas of synthons and retrones, functional group transformation and interconversions of Simple functionalities.	To understand, **(a) Organometallic compounds like,** Organo-magnesium, Organo-zinc, Organo-lithium, organo-copper and organo-tin reagents. Additions of organometallic reagents to carbonyl and unsaturated carbonyl compounds, Witting reaction. **(b) Different kinds of Methodologies in organic synthesis** Ideas of synthons and retrones, Functional group transformation, Interconversions of Simple functionalities	Student got unders Organo-magnesium organo-copper and Additions of organo unsaturated carbony Witting reaction. Student got unders Methodologies in o Ideas of synthons a Functional group tr Interconversions o
Unit – IV (a) Hydroboration: Mechanism and synthetic applications	**(a) Hydroboration** Introduction of Hydroboration, Mechanism, Synthetic applications	Student got unders Hydroboration, Me applications

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B.A. / B.Sc. / M.A. / M.Sc.	: **M.Sc. I**
NAME OF SUBJECT	: Inorganic Chemistry
SEM I / II / III / IV / V / VI	: **Sem. II**
COURSE NUMBER (PAPER NUMBER)	: HCP-201
TITLE OF COURSE (NAME OF PAPER)	**: Inorganic Chemistry**

COURSE CONTENT	OBJECTIVES	OUTCOME
Unit-I: Chemistry of Non-transition Elements General discussion of the properties of non- transition elements, special features of the individual elements, synthesis, properties and structure of their halides and oxides, polymorphism of carbon, phosphorous, sulphur. Synthesis, structure and properties of boranes, carboranes, borazines, silicates, carbides, silicones, phosphazenes, sulphur nitrogen compounds, oxyacids of nitrogen, phosphorous, sulphur and halogen, interhalogens, pseudohalides and noble gas compounds.	1. To help the students to understand properties of non transition elements, individual element, 2. To help students to understand polymorphism 3. To help the students to understand synthesis, structure, and properties of various compounds	1. Students understood properties of non transition elements, individual element, students to understand polymorphism 2. students understood synthesis, structure, and properties of various compounds
Unit-II: Organometallic Chemistry of Transition Elements Synthesis, structure and bonding, organometallic reagents in organic synthesis and in homogenous catalytic reactions (hydrogenation,	1. To help the students to understand organiometallic compounds 2. To help the students to understand synthesis of organometallic compounds	1. Students understand concept of organometallic compounds 2. Students understand

hydroformylation, isomerization,Monsanto acetic acid process, synthesis gas, Wacker Process), Ziegler and Natta catalysis, pi-metal complexes, activation of small molecules by coordination.	3. To help students to understand various reactions including organometallic compounds as catalyst	synthesis of organometallic compounds 3. students understood various reactions including organometallic compounds as catalyst
Unit-III: A) Metal- Ligand Equillibria in Solution Stepwise and overall formation constants and their interaction, trends in stepwise constants, factors affecting the stability of metal complexes with reference to the metal ion and ligand, chelate effect and its thermodynamic origin, determination of formation constants by pH-metry and spectrophotometry.	To get knowledge about stability of complexes	Student understood the meaning of complex and factors affecting the stability of complex and also how to determine the stability of complex
Unit-III: B) Chemistry of Lanthanides and Actinides Lanthanides: Introduction, spectral and magnetic properties. Classical methods of separation of lanthanides: (i) precipitation (ii) thermal reaction, (iii) fractional crystallization, (iv) complex formation, (v) solvent extraction and (vi) ion exchange. Use of lanthide compounds as shift reagent. Applications of lanthanides. Actinides: Introduction, spectral and magnetic properties. Methods of separation of actinides. Preparation of trans-uranic elements. Applications of actinides. Further extension of periodic table.	1. To help the students to understand about lanthanide and actinide 2. To help the students to understand electronic configuration, occurrence separation techniques of lanthanides 3. To help the students to understand electronic configuration, methods of preparation of trans uranic element	1. Students understand lanthanide and actinides 2. Students understand electronic configuration, separation techniques of lanthanide 3. Students understand preaparation techniques of actinide
Unit-IV: Metallurgy Occurance, extraction, properties and applications of copper, silver, gold, zinc, tin and lead.	Students should get knowledge about; The concept of Metallurgy, occurrence of metals and their separation methods.	Students understood the existence of metallic elements and the types of their compounds in the nature. They also learn

		the principle and methodology of separation techniques of metals.

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M.Sc. I		
NAME OF THE SUBJECT- CHEMISTRY		
SEM- II (CBCS)		
COURSE NUMBER (PAPER NUMBER) - II		
TITLE OF COURSE (NAME OF PAPER)- Organic Chemistry		
COURSE CONTENT	**OBJECTIVES**	
Unit-I **(a) Study of following reactions with mechanism:** Dieckmann, Benzoin, Favorskii reaction, Reimer-Tieman, Stobbe, Diels-Alder, Robinson annulation, Chichibabin, Simon-Smith, Ulhmann, Mc. Murry and Dakin**.**	• To understand the various name reactions, steps, intermediates, their mechanism and applications , with different examples.	• Students easily ide mechanism steps an name reactions.
(b) Reagents in organic syntheses: Complex metal hydrides, LDA, dicyclohexylcarbodiimide(DCC), PTC, crown ethers, Merrifield resin, Peterson's synthesis, 1,3-dithiane, diazomethane, DDQ.	• Students must able to use various reagents used for reactions and their properties.	• Students use the re the requirement of re their properties.
Unit – II **(a) Reduction:** Study of following reductions: Catalytic hydrogenation using homogeneous and heterogeneous catalysts. Study of following reactions: Wolff-Kishner, MeerweinPondorffVerley, Birch, Clemmensen, Sodium borohydride, Lithium Aluminium hydride (LAH) and Sodium in alcohol.	• Study of following reductions: Catalytic hydrogenation using homogeneous and heterogeneous catalysts. Study of following reactions: Wolff-Kishner, MeerweinPondorffVerley, Birch, Clemmensen, Sodium borohydride, Lithium Aluminium hydride (LAH) and Sodium in alcohol.	•Students able to S Catalytic hydrogena heterogeneous catalysts. Study of f Kishner, Meerwein Clemmensen, Sodiu Aluminium hydride

(b) Oxidation: Application of following oxidizing agents: $KMnO_4$, chromium trioxide (Jone's reagent, PCC, PDC), Manganese dioxide, Osmium tetraoxide, Oppenauer oxidation and Lead tetra-acetate., Hydrogen peroxide, Baeyer-Villiger oxidation, Prevost-Woodward hydroxylation by silver oxide.	• Students must know how to Apply the following oxidizing agents: $KMnO_4$, chromium trioxide (Jone's reagent, PCC, PDC), Manganese dioxide, Osmium tetraoxide, Oppenauer oxidation and Lead tetra-acetate., Hydrogen peroxide, Baeyer-Villiger oxidation, Prevost-Woodward hydroxylation by silver oxide.	• Students able to A agents: $KMnO_4$, ch PCC, PDC), Manganese Oppenauer oxidatio Hydrogen peroxide Prevost-Woodward
Unit – III **(a) Study of Organometallic compounds**: Organo-magnesium, Organo-zinc, Organo-lithium, organo-copper and organo-tin reagents. Addition reactions: Additions to carbonyl and unsaturated carbonyl compounds, Witting reaction.	• **Students** should study the metals and organic compounds like Organo-magnesium, Organo-zinc, Organo-lithium, organo-copper and organo-tin reagents. Addition reactions: Additions to carbonyl and unsaturated carbonyl compounds, Witting reaction.	• Students able to re Organo-zinc, Organ organo-tin reagents Addition reactions: unsaturated carbony reaction.
(b) Methodologies in organic synthesis: Ideas of synthons and retrones, functional group transformation and interconversions of Simple functionalities.	• Students should know the Ideas of synthons and retrones, functional group transformation and interconversions of Simple functionalities.	• Students understoo retrones, functional interconversions of
Unit – IV (a) Hydroboration: Mechanism and synthetic applications (b) Enamines :Formation and reactivity of enamines (c) Protection of functional group: Principle of protection of alcohol, amine, carbonyl and carboxyl group**.**	• To understand the reactions like hydroboration, enamines and during desired reactions and desired product formation protection of functional group for alcohols, amines, carbonyl, carboxyl**.**	• Students understo enamines and know protection for alcoh carboxyl.

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M.Sc.I
NAME OF SUBJECT: Physical Chemistry

SEM II		
COURSE NUMBER (PAPER NUMBER) HCT-203		
TITLE OF COURSE (NAME OF PAPER): Physical Chemistry-II		
COURSE CONTENT	**OBJECTIVES**	
Chemical Kinetics Rate determining step, steady state approximation. fractional order kinetics, Higher order kinetics and their examples. Reaction mechanism: Thermal decomposition of acetaldehyde, ethane, reaction between hydrogen and halogens, reaction between NO2 and F2, Decomposition of Ozone. Ionic reactions: Primary and secondary salt effect, Effect of ionic strength and dielectric constant of medium on the rate of ionic reactions in solution.	To know about the Rate determining step, steady state approximation. fractional order kinetics, Higher order kinetics and their examples. To study the Reaction mechanism: Thermal decomposition of acetaldehyde, ethane, reaction between hydrogen and halogens, reaction between NO2 and F2, Decomposition of Ozone. Ionic reactions: To understand the Primary and secondary salt effect, Effect of ionic strength and dielectric constant of medium on the rate of ionic reactions in solution.	Understands the R state approximatio Higher order kinet Able to study the F decomposition of a between hydrogen NO2 and F2, Deco reactions: Understands the Pr Effect of ionic stre medium on the rat
Photochemistry Introduction, Absorption of light and nature of absorption spectra, electronic transitions, Franck–Condon principle, electronic excitation, photodissociation and Predissocition, photoreduction, photooxidation, photochemistry in environment (Green house effect, ozone depletion).	To know the basic concept of Introduction, Absorption of light and nature of absorption spectra, electronic transitions, Franck–Condon principle, electronic excitation, photodissociation and Predissocition, photoreduction, photooxidation, photochemistry in environment (Green house effect, ozone depletion).	Students should k Introduction, Abso absorption spectra, Franck–Condon pr photodissociation a photoreduction, ph environment (Gree depletion).

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M.Sc. I		
NAME OF SUBJECT: Instrumental Methods of Analysis		
SEM II		
COURSE NUMBER (PAPER NUMBER) OET-204A		
TITLE OF COURSE (NAME OF PAPER): Instrumental Methods of Analysis		
COURSE CONTENT	**OBJECTIVES**	
Unit-1: A) Ultraviolet and visible Spectrophotometry Introduction, Beer Lambert's law. Instrumentation, calculation of absorption	**To know** the Beer Lambert's law. Instrumentation, calculation of absorption maxima of dienes,dienones and polyenes, Qualitative and Quantitative applications	**Students are able** Beer Lambert's law absorption maxima Qualitative and Qua

maxima of dienes,dienones and polyenes, Qualitative and Quantitative applications		
Unit-1: B)Infra-red spectroscopy Introduction, instrutnentation, sampling technique, selection rules, types of bonds, absorption of common functional groups. Factors affecting frequencies, applications	**To know**instrumentation, sampling technique, selection rules, types of bonds, absorption of common functional groups. Factors affecting frequencies, applications	**Students are gain** Instrutnentation, sa types of bonds, abs groups. Factors affe
Unit-2: Nuclear Magnetic Resonance NMR: Introduction, principle, magnetic and nonmagnetic nucler , processional motion, Larmor frequency, absorption of radio frequency, Instrumentation (FT-NMR). Sample preparation, shielding and deshielding effects, chemical shift, internal standards, factor influencing chemicalshifts, solvent used, peak area and proton ratio, anisotropic effect, spin-spin coupling, couplingconstant and application to simple structure problem.	**To knowthe** principle of NMR, magnetic and nonmagnetic nuclei , processional motion, Larmorfrequency, absorption of radio frequency, Instrumentation (FT-NMR). Sample preparation,shielding and deshielding effects, chemical shift, internal standards, factor influencing chemicalshifts, solvent used, peak area and proton ratio, anisotropic effect, spin-spin coupling, couplingconstant and application to simple structure problem.	**Students are gain** Principle of NMR, , processional moti of radio frequency, Sample preparation effects, chemical sh influencing chemic and proton ratio, an coupling, coupling simple structure pro
Unit-3: A) Mass spectroscopy Principle, working of mass spectrometer (double beam). Formation of different types of ions, Mc Lafferty rearrangements, fragmentation of alkanes, alkyl aromatics, alcohols and ketones in briefsimple applications.	**To know the** Principle, working of mass spectrometer (double beam). Formation of different types of ions, Mc Lafferty rearrangements, fragmentation of alkanes, alkyl aromatics, alcohols and ketones in briefsimple applications.	**Students are able** ThePrinciple, work beam). Formation o McLafferty rearran alkanes, alkyl arom brief simple applica
Unit-3: B) Simple structural problems based on IR,UV, NMR and MS.	**To solve the** Simple structural problems based on IR,UV, NMR and MS.	**Students are able** problems based on
Unit-4: A) Atomic Absorption Spectroscopy Introduction, principle, difference between AAS and FES. Advantages of AAS over FES,Disadvantages of AAS, Instrumentation, Single and double beam AAS, Detection limits andsensitivity, Interference, Applications.	**To know the**principle, difference between AAS and FES. Advantages of AAS over FES, Disadvantages of AAS, Instrumentation, Single and double beam AAS, Detection limits and sensitivity, Interference, Applications.	**Students are gain** Principle, differenc Advantages of AAS AAS, Instrumentati AAS, Detection lim Applications.
Unit-4: B) Inductively Coupled Plasma Spectroscopy Introduction, nebulization, torch, plasma, instrumentation, interferences, Applications.	**To know the**nebulization, torch, plasma, instrumentation, interferences, Applications.	**Students are gain** Nebulization, torch interferences, Appl

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