MCM DAV College for Women, Sector – 36A, Chandigarh Monthly Teaching Plans (Odd Semester) Session – (2023-24)

Name of the Teacher: Dr. Nisha Dawra

Department: Chemistry

Class: M.Sc I Subject: Inorganic Chemistry

S.No.		Date onthly)	Topics to be Covered	Academic Activity
	From	To	1	Undertaken*
1	16-08.2023	05.09.2023	VSEPR, Walsh diagrams (tri and tetra-molecules), d π -p π bonds, Bent rule and energetics of hybridization, some simple reactions of covalently bonded molecules.	Lecture
2	06.09.2023	20.09.2023	Limitations of crystal field theory, molecular orbital theory, octahedral, tetrahedral and square planar complexes, π bonding and molecular orbital theory.	Lecture
3	21.09.2023	04.10.2023	Stepwise and overall formation constant and their interaction, trends in stepwise constants, factors affecting the stability of metal complexes with reference to the nature of metal ion and ligand, chelate effect and its thermodynamic origin,	Lecture
4	05.10.2023	18.10.2023	Determination of binary formation constants by pH spectrophotometry. Energy profile of a reaction, reactivity of metal complexes,	Lecture and group discussion
5	19.10.2023	31.10.2023	Inert and labile complexes, kinetic application of valance bond and crystal field theories, kinetics of octahedral substitution. Acid hydrolysis, factors affecting acid hydrolysis, Base hydrolysis, conjugate base mechanism, direct and indirect evidences in favour of conjugate mechanism, reactions without metal-ligand bond cleavage	Lecture

6	01.10.2023	Till exams	. Substitution reactions in square	Lecture and	
			planar complexes, the trans effect,	Group discussion	
			mechanism of substitution reaction,		
			Redox reactions, electron transfer		
			reactions, mechanism of one		
			electron transfer reactions, outer		
			sphere type reactions, Cross		
			reactions and Marcus Hush Theory,		
			inner sphere type reactions		
Departme	ental Meeting	to Coordinate an	d Review the Monthly completion of	f Syllabus as per	
	.		lesson plans		
29 th	The teacher	s have completed	the scheduled chapters and topics as sh	nown in the lesson	
September,	plan				
2023					
Departmo	ental Meeting	to Coordinate an	d Review the Monthly completion of	f Syllabus as per	
			lesson plans		
21 st	The teacher	s have completed	the scheduled chapters and topics as sh	nown in the lesson	
October,			plan		
2023					
Departme	ental Meeting	to Coordinate an	d Review the Monthly completion of	f Syllabus as per	
			lesson plans		
15 th	The teacher	s have completed	the scheduled chapters and topics as sh	nown in the lesson	
November,			plan		
2023					

^{*}Any of these – (i) Lecture Method; (ii) PPT; (iii) Online Sources; (iv) Group Discussion; (v) Case Studies etc.Other Methods adopted by the teacher – Please write the specific teaching method

MCM DAV College for Women, Sector – 36A, Chandigarh Monthly Teaching Plans (Odd Semester) Session – (2023-24)

Name of the Teacher: Dr. Qudrat Hundal and Dr. Swatika Sharma

Department: Chemistry

Class: M.Sc I Subject: Organic Chemistry CH-412

S.No		ate nthly)	Topics to be Covered	Academic Activity Undertaken*
	From	To		
1	16-08-2023	02-09-2023	Unit I Nature of Bonding in Organic molecules: Fundamental concepts, Delocalized chemical bonding, conjugation, Cross conjugation, resonance, hyper-conjugation.	Lecture method
2	04.09.2023	05.10.2023	Unit I Nature of Bonding in Organic molecules: Bonding in fullerenes, Tautomerism, Aromaticity in benzenoid and non-benzenoid compd. Alternant and non-alternant hydrocarbons, Huckel's rule. Energy level of π M.O., Annulenes, antiaromaticity, aromaticity, Homo aromaticity, PMO approach. Bonds weaker than covalent, addition compound, crown ether complexes and cryptands, Inclusion compound, cyclo dextrins, Catenanes & rotaxanes. Effect of structure on reactivity-resonance and field effects, steric effect, quantitative treatment. The Hammett equation and linear free energy relationship, substituent and reaction constants. Taft equation.	Lecture method PPT
3	16-08-2023	26-09-2023	Unit III Aliphatic Nucleophilic substitution: S_N1 and S_N2 , Neighbouring group participation. Phase transfer catalysis, ambident nucleophiles, regioselectivity, esterification and ester hydrolysis. S_N i mechanism, SET mechanism,	Lecture method

			E-dCON			
			Factors affecting reactivity in SN			
			reactions. Nucleophilic substitution			
			at an allylic carbon, aliphatic trigonal			
			carbon and at a vinylic carbon. Phase			
			transfer catalysis, ambident			
			nucleophiles, regioselectivity,			
			esterification and ester hydrolysis.			
			Aliphatic Electrophilic substitution:			
			SE1, SE2 and SEi. Electrophilic			
			substitution accompanied by double			
			bond shifts, Factors affecting			
			electrophilic substitution reactions.			
4	27-09-2023	Till exam	Unit IV Aromatic Electrophilic	Lecture method		
			substitution: Arenium ion			
			mechanism, orientation and			
			reactivity, energy profile diagrams,			
			Nitration, sulphonation,			
			halogenations, Friedel-Crafts			
			reaction and Friedel-Crafts acylation.			
			o/p- ratio. Ipso attack, orientation in			
			other ring systems. Vilsmeier-Haack			
			Reaction, Gatterman-Koch Reaction,			
			Diazonium coupling.			
			Aromatic Nucleophilic substitution:			
			Unimolecular and Bimolecular			
			mechanism. Aromatic Nucleophilic			
			Substitution Reaction via Benzynes.			
			Factors affecting reactivity. Von			
			Richter Rearrangement, Smiles			
			Rearrangement and Sommelet-			
			Hauser Rearrangement.			
5	06-10-2023	15-11-2023	Unit II Stereochemistry: Geometrical	Lecture method		
	00 10 2023	13 11 2023	Isomerism, Conformational	Dectare method		
			Analysis, Conformation of Acyclic			
			systems, cycloalkanes, sugars and			
			decalins. Effect of conformation on			
			reactivity. Steric strain due to			
			undesirable crowding of resolution.			
			Stereospecific and stereoselective			
			<u> </u>			
			synthesis, chirality due to helical			
			shape. Stereochemistry of			
6	16.11.2023	Till avens	compounds containing N, S, P			
6	10.11.2023	Till exams	Revision and Solution of previous			
Donor	tmontal Mast	ng to Coordina	years' question papers	n of Syllohus os non		
Depar	Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans					
29 th	The teachers	have completed	the scheduled chapters and topics as she	own in the lesson plan		
_	The teachers	nave completed	i die senedured enapiers and topies as sil	own in the lesson pian		
Septem ber,						
2023						
	l tmental Maati	ng to Coording	te and Review the Monthly completion	n of Syllahus as nor		
Depar	uncniai wieeli	ng to Cooruilla	· · · · · · · · · · · · · · · · · · ·	n of Synabus as per		
lesson plans						

21 st	The teachers have completed the scheduled chapters and topics as shown in the lesson plan
Octobe	
r, 2023	
Depart	tmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per
	lesson plans
19 th	The teachers have completed the scheduled chapters and topics as shown in the lesson plan
Novem	
ber,	
2023	

^{*}Any of these – (i) Lecture Method; (ii) PPT; (iii) Online Sources; (iv) Group Discussion; (v) Case Studies etc.Other Methods adopted by the teacher – Please write the specific teaching method

MCM DAV College for Women, Sector – 36A, Chandigarh Monthly Teaching Plans (Odd Semester) Session – (2023-24)

Name of the Teacher: Dr. Sagarika Dev

Department: Chemistry

Class: M.Sc. I Subject -Physical Chemistry

S.No.	Date (Monthly)		Topics to be Covered	Academic Activity Undertaken*
	From	To		
1	16.08.2023	31.08.2023	Schrodinger wave equation to different systems,	Lecture method
2	01.09.2023	15.09.2023	Approximation method, Variation Theorm, Perturbation Theory, Self- Consistent Field Theory. Concept of distribution, thermodynamic probability & most probable distribution, ensemble averaging, postulates of ensemble averaging, canonical, grand canonical & micro canonical ensembles.	Lecture Method
3	16.09.2023	30.09.2023	Ordinary angular momentum, generalized angular momentum, eigenfunctions for angular momentum, eigen values of angular momentum, using ladder operators, addition of angular- momenta, spin, anti- symmetry and Pauli exclusion principle.	Lecture Method, Group discussion
4	03.10.2023	15.10.2023	Corresponding distribution laws (using Lagrange's method of undetermined multipliers) Partition functions: Translational, Rotational, Vibrational,	

			Electronic partitions				
			functions. Partial molal				
			properties, partial molal				
			free energy, volume &				
			heat content and their				
			significance, determination				
			of these quantities, concept				
			of fugacity and				
			determination of fugacity.				
5	16.10.2023	31.10.2023	Calculation of	Lecture Method, Online			
			Thermodynamic properties	sources			
			in terms of partition				
			functions. Heat capacity,				
			behaviour of solids				
			chemical equilibria and				
			equilibrium constant in				
			terms of partition function,				
			F.D. statistics, distribution				
			law and application to				
			metals. Bose Einsteins				
			statistics. Distribution law				
			& application to Helium.				
			ex application to Heriani.				
			Non ideal systems, excess				
			functions for non-ideal				
			solutions, Activity,				
			Activity coeff, Debye				
			huckel theory for activity				
			coeff. electrolyte solutions,				
			determination of activity &				
			activity coeff, ionic				
			strength. Application of				
			phase rule to 3-component				
			system, second order phase				
			transitions.				
6	01.11.2023	Till exams	Revision and Solution of				
O	01.11.2023	Till Cadills	previous years' question				
			papers				
Denartme	⊥ ntal Meeting to	Coordinate an	d Review the Monthly compl	etion of Syllahus as ner			
Departme.	ntai wiccing to		lesson plans	ection of Synabus as per			
29 th	The teachers l		the scheduled chapters and top	oics as shown in the lesson			
September,			plan				
2023							
Departme	ntal Meeting to		d Review the Monthly compl lesson plans	etion of Syllabus as per			
21 st	The teachers have completed the scheduled chapters and topics as shown in the lesson						
October,			plan				
2023			L				
	Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per						
			lesson plans				

19 th	The teachers have completed the scheduled chapters and topics as shown in the lesson
November,	plan
2023	

^{*}Any of these – (i) Lecture Method; (ii) PPT; (iii) Online Sources; (iv) Group Discussion; (v) Case Studies etc.Other Methods adopted by the teacher – Please write the specific teaching method

MCM DAV College for Women, Sector – 36A, Chandigarh Monthly Teaching Plans (Even Semester) Session – (2023-24)

Name of the Teacher: Dr. Rishu

Department: Chemistry

Class: M.Sc I Subject: Inorganic Chemistry

S. No.			Topics to be Covered	Academic Activity
	From	thly) To		Undertaken*
1	09 -01- 2024	31-01-2024	Electronic Spectra and Magnetic Properties of Transition Metal Complexes-I: Spectroscopic ground states, correlation, Orgel and Tanabe-Sugano diagrams for transition metal complexes (d 1 -d 9 states), calculations of Dq, B and β parameters, charge transfer spectra, Isopoly and Heteropoly Acids and Salts	Lecture Method, PPT Group Discussion
2	01.02.2024	29.02.2024	Electronic Spectra and Magnetic Properties of Transition Metal Complexes-II: Spectroscopic method of assignment of absolute configuration in optically active metal chelates and their stereo chemical information, anomalous magnetic moments, magnetic exchange coupling and spin crossover.	Lecture Method, PPT Group Discussion
3	01.03.2024	28.03.2024	Metal Π–Complexes: Metal carbonyls, structure and bonding, vibrational spectra of metal carbonyls for bonding and structure elucidation, important reaction of metal carbonyls. Preparation, bonding structure and important reactions of transition metal nitrosyl,	Lecture Method and Group Discussion

			dinitrogen and dioxygen complexes,				
			tertiary phosphine as ligand.				
4	29.03.2024	18.04.2024	Metal Cluster: Higher boranes, Lecture Method and				
			carboranes, metallobranes and Group Discussion				
			metallocarboranes, metal carbonyl				
			and halide clusters, compounds with				
			metal-metal multiple bonds.				
			metal-metal multiple bonds.				
31 st	The teachers 1	have completed	the scheduled chapters and topics as shown in the lesson plan				
Jan,		1					
2024							
Depai	rtmental Meetii	ng to Coordinat	te and Review the Monthly completion of Syllabus as per				
			lesson plans				
23 rd	The teachers l	have completed	the scheduled chapters and topics as shown in the lesson plan				
Feb,							
2024							
Depai	rtmental Meetii	ng to Coordinat	te and Review the Monthly completion of Syllabus as per				
_			lesson plans				
27 th ,	The teachers l	have completed	the scheduled chapters and topics as shown in the lesson plan				
March		•					
2024							
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per							
-	lesson plans						
18 th	The teachers 1	have completed	the scheduled chapters and topics as shown in the lesson plan				
April,		_					
2024							

^{*}Any of these – (i) Lecture Method; (ii) PPT; (iii) Online Sources; (iv) Group Discussion; (v) Case Studies etc.Other Methods adopted by the teacher – Please write the specific teaching method

MCM DAV College for Women, Sector – 36A, Chandigarh Monthly Teaching Plans (Even Semester) Session – (2023-24)

Name of the Teachers: Dr. Madhuri Tanaji Patil

Department: Chemistry

Class: M.Sc I Subject: Organic Chemistry 1 (CH-422)

Sr.	D	ate	Topics to be Covered	Academic
No.	(Mo	onthly)		Activity
	From	To		Undertaken*
1.	09.01.2024	31.01.2024	Unit 1: Reaction Mechanism, Structure and	Lecture
			Reactivity: Types of mechanism, types of	method
			reactions, thermodynamics and kinetic	&
			requirement. Kinetic & thermodynamics control	Group
			Hammond's postulate, Curtin-Hammett	discussion
			Principle, Potential energy diagrams, transition	about
			states and intermediates, method of determining	Introduction to
			mechanisms, isotope effects.	good reference
			Addition to Carbon-Carbon Multiple Bonds	books
			Mechanistic and stereochemical aspects of	
			addition reaction involving electrophiles,	
			nucleophiles and free radicals, regio selectivity	
			and chemo selectivity, orientation and reactivity.	
			Addition to cyclopropane ring. Hydrogenation	
			of double and triple bonds, hydrogenation of	
			aromatic ring. Hydroboration. Michael reaction.	
			Sharpless asymmetric epoxidation.	
2.	01-02-	08.02.2024	Unit 3: Free Radical Reactions	
	2024		Type of free radical reactions, free radical	
			substitution mechanism at an aromatic substrate,	
	00.02	10.02.2021	neighbouring group assistance.	•
3.	09-02-	19-02-2024	Unit 2: Addition To Carbon-Heteroatom	Lecture
	2024		Multiple Bonds	Method &
			Mechanism of metal hydride reduction of	Group
			saturated and unsaturated carbonyl compounds	Discussion for
			acids, esters and nitriles.	Importance of reaction
			Unit 2: Addition To Carbon-Heteroatom	
			Multiple Bonds Machanism of metal hydride reduction of	mechanism and basics of
			Mechanism of metal hydride reduction of	
			saturated and unsaturated carbonyl compounds	proper
<u> </u>			acids, esters and nitriles. Addition of Grignard	

			reagents, organozinc and organolithium reagents	structure
			to carbonyl and unsaturated carbonyl	drawing
	20.02	27.02.2024	compounds.	
4.	20-02-	27.02.2024	Unit 3: Free Radical Reactions	
	2024		Reactivity for aliphatic and aromatic substrates	
			at a bridgehead. Reactivity in the attacking	
			radicals. The effect of solvents on reactivity.	
			Allylic halogenation (NBS), oxidation of	
			aldehydes to carboxylic acids, auto-oxidation.	
5.	28.02.2024	18.03.2024	Unit 2: Addition To Carbon-Heteroatom	Lecture
			Multiple Bonds	Method &
			Wittig reaction. Mechanism of condensation	Assignments
			reactions involving enolates-Aldol,	and class tests
			Knoevenagel, Claisen, Mannich, Benzoin,	
			Perkin and Stobbe reactions. Hydrolysis of	
			esters and amides, ammonolysis of esters.	
			Unit 4: Pericyclic Reactions	
			Molecular orbital symmetry, frontier orbitals of	
			ethylene, 1,3-butadiene, 1, 3, 5-hexatriene and	
			allyl system. Classification of pericyclic	
			reactions. Woodward-Hoffmann correlation	
			diagrams. FMO and PMO approach.	
			Electrocyclic reactions conrotatory and	
			disrotatory motions 4n, 4n +2 and allyl system.	
			Cycloadditions-antarafacial suprafacial	
			additions, 4n and 4n+2 systems, 2+2 addition of	
			ketenes, 1, 3-dipolar cycloadditions and	
			cheletropic reactions.	
6.	19.03.2024	27.03.2024	Unit 3: Free Radical Reaction	
			Coupling of alkynes and arylation of aromatic	
			compounds by diazonium salts. Sandmeyer	
			reaction. Free Radical Rearrangement.	
			Hundiecker reaction.	
			Unit 3: Elimination Reaction	
			The E2, E1 and E1cB mechanisms and their	
			spectrum, Orientation of the double bond.	
7.	28.03.2024	11.04.2024	Unit 4: Pericyclic Reactions	Lecture
			Sigmatropic rearrangements-Suprafacial and	method &
			antarafacial shifts of H. Sigmatropic shifts	Group
			involving carbon moieties, [3, 3]-and [5, 5]-	discussion
			sigmatropic rearrangements. Claisen, Cope and	Revision and
			aza-Cope rearrangement. Fluxional	paper solving
			tautomerism. Ene reaction.	
8.	12.04.2024	Till exams	Unit 3: Elimination Reaction	
			Reactivity effects of substrate structure,	
			attacking base, the leaving group and the	
			medium. Mechanism and orientation in pyrolytic	
			elimination.	
De	partmental M	leeting to Coor	dinate and Review the Monthly completion of S	vllabus as per

Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans

31 st	The teachers have completed the scheduled chapters and topics as shown in the lesson				
January,	plan				
2024					
Departmen	ntal Meeting to Coordinate and Review the Monthly completion of Syllabus as per				
	lesson plans				
23 rd	The teachers have completed the scheduled chapters and topics as shown in the lesson				
February,	plan				
2024					
Departmen	Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per				
	lesson plans				
27 th	The teachers have completed the scheduled chapters and topics as shown in the lesson				
March,	plan				
2024					
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per					
lesson plans					
18 th April,	The teachers have completed the scheduled chapters and topics as shown in the lesson				
2024	plan				

^{*}Any of these – (i) Lecture Method; (ii) PPT; (iii) Online Sources; (iv) Group Discussion; (v) Case Studies etc. Other Methods adopted by the teacher – Please write the specific teaching method

Mehr Chand Mahajan D.A.V. College for Women, Sector – 36A, Chandigarh Monthly Teaching Plans (Even Semester) Session –2023-2024

Name of the Teacher: Dr. Nisha Dawra

Department: Chemistry

Class: M. Sc. -I Chemistry Subject: Physical Chemistry (CH-423)

S. No.	(Monthly)		Topics to be Covered	Academic Activity Undertaken*
	From	To		
1.	09 -01- 2024	24-01-2024	Unit-1: Chemical Dynamics: Methods of determining rate laws, ionic reactions, kinetic salt effects, steady state kinetics, kinetic & thermodynamic control of reactions, treatments of unimolecular reactions, Dynamic chain (pyrolysis of acetaldehyde composition of ethane), Unit 3: Surface Chemistry: Adsorption, surface tension, capillary action, Laplace equation, Kelvin equation, Gibb's adsorption isotherm, BET equation.	Lecture, PPT
2.	25.01.2024	15.02.2024	Unit 1: Chemical Dynamics: Photochemical (H ₂ -Cl ₂) reactions & oscillatory reactions (Belousov-Zhabotinsky reaction), homogeneous catalysis, kinetics of enzyme reactions, general features of fast reactions, Study of fast reactions by flow method, relaxation method, flash photolysis, and NMR method dynamics of molecular motion, probing the transition state, dynamics of barrier less chemical reactions in solution Unit 3: Surface Chemistry: electro kinetic phenomenon, catalytic activity on surfaces. Micelles: Surfactants, classification, micellisation, critical micellisation	Lecture, Online sources

			concentration (CMC), factors affecting	
			CMC, counter ions binding to micelles, thermodynamics of micellization-phase	
			separation, mass action models,	
			solubilization, microemulsions, reverse	
			micelles	
3.	16.02.2024	11.03.2024	Unit 1: Chemical Dynamics:	Lecture, group
			Dynamics of unimolecular reaction	discussion and
			(Lindemann-Hinshelwood and Rice-	seminar
			Ramsperger-Kassel-Marcus Theories of	
			unimolecular reactions).	
			Unit 2: Non-equilibrium	
			Thermodynamics:	
			Thermodynamic criteria for non-	
			equilibrium states, entropy production	
			and entropy flow, entropy balance	
			equations for different irreversible processes (eg. heat flow, chemical	
			reaction etc.), Transformation of	
			generalized fluxes and forces, non-	
			equilibrium stationary states,	
			phenomenological equators,	
			microscopic reversibility and Onsager's	
			reciprocity relations, electro kinetic	
			phenomenon	
			Unit 4: Electrochemistry	
			Electrochemistry of solutions, Debye	
			Huckel Treatment and its extension, ion-	
			solvent interaction, Debye Huckel-	
			Jerum model, Thermodynamics of	
			electrified interface equations,	
			derivation of electro capillarity,	
			Lipmann equations, Methods of	
			determining structures of electrified	
			interface, Guoy-Chapmann, Stern Over	
			potentials.	

4.	12.03.2024	05.04.2024	Unit 2: (a) Non-equilibrium Thermodynamics: Diffusion, electrical conduction, irreversible thermodynamics for biological system, coupled reactions. Unit 2: (b) Macromolecules: Electrically conducting, fire resistant, liquid crystal polymers, Kinetics of polymerization, Mechanism of polymerization, molecular mass determination (osmometry, viscometry, diffusion & light scattering methods), sedimentation. Unit 4: Electrochemistry Exchange current density, Butler Volmer equation, Tafel plots, Quantum aspects of charge transfer at electrode solutions, quantization of charge transfer, Semiconductor interfaces-theory of double layer of interfaces, effects of light at semiconductor solution interface. Electrocatalysis: Influence of various parameters, H-electrode, polarography, Ilkovic equation, half wave potential and its significance, electrocardiography.	Lecture, group discussion and seminar
5.	06.04.2024	Till exam	Unit 2: (b) Macromolecules: Chain configuration of macromolecules, calculation of average dimensions. Unit 4: Electrochemistry Introduction to corrosion, homogeneous theory, forms of corrosion, corrosion monitoring.	Lecture

Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per					
	lesson plans				
31 st	The teachers have completed the scheduled chapters and topics as shown in the lesson				
January,	plan				
2024					
Departme	ntal Meeting to Coordinate and Review the Monthly completion of Syllabus as per				
	lesson plans				
23 rd	The teachers have completed the scheduled chapters and topics as shown in the lesson				
February,	plan				
2024					
Departme	ntal Meeting to Coordinate and Review the Monthly completion of Syllabus as per				
lesson plans					
27 th	The teachers have completed the scheduled chapters and topics as shown in the lesson				
March,	plan				
2024					

Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per				
lesson plans				
18 th April,	The teachers have completed the scheduled chapters and topics as shown in the lesson			
2024	plan			

^{*}Any of these – (i) Lecture Method; (ii) PPT; (iii) Online Sources; (iv) Group Discussion; (v) Case Studies etc. Other Methods adopted by the teacher – Please write the specific teaching method

MCM DAV College for Women, Sector – 36A, Chandigarh Monthly Teaching Plans (Even Semester) Session – (2023-24)

Name of the Teacher/s: Dr. Sagarika Dev

Department: Chemistry

Class: M.Sc. I Subject: Group Theory and spectroscopy

S.No.	Date (Monthly)		Topics to be Covered	Academic Activity Undertaken*	
1	From 09 -01- 2024	To 23-01-2024	Symmetry elements & symmetry operation, definitions of group, subgroup, relation between orders of a finite group & its sub groups. Point group	Lecture method, PPT, Videos from NPTEL	
			Classification of molecules rigid rotor model, effect of isotopes; non rigid rotor Stark effect, nuclear and electron spin interaction & effect of external field.		
2	24.01.2024	15.02.2024	Representations of groups by matrices (representation for the Cn, Cnv, Cnh, Dnh etc. group) character of a representation. The great orthogonality theorem and its importance character tables and their use-in spectroscopy.	Lecture method, PPT, Videos from NPTEL	
			Infrared Spectroscopy: - Linear Harmonic Oscillator, Vibrational energy of diatomic molecule zero- point energy, force constants & bond lengths anharmonicity, morse potential energy diagram. Vibrational rotational		

	l			
			spectroscopy, P, Q, R, branches. Selection rules Normal modes of vibration, group frequencies, overtones, hot bands, Raman Vibrational: - Classical & quantum theories of Raman effect pure rotational, vibrational and vibrational. Rotational Raman spectroscopy. Coherent anti stokes Raman spectroscopy	
3	16.02.2024	12.03.2024	Nuclear Magnetic Resonance Spectroscopy: - Nuclear spin, nuclear resonance, shielding of magnetic nuclei, chemical shifts deshielding, spin-spin interactions, (ABX, AMX, ABC, A2 B2) spin decoupling. Electron Spin resonance spectroscopy: - Basic values factors affecting 'g' value. Measurements, techniques, applications. Nuclear Quadrupole Resonance spectroscopy: - Quadrupole Nuclear moments, electic field gradient complex constants	Lecture Method, Online Sources
4	13.03.2024	05.04.2024	applications Energy levels, molecular orbital, Frank Condon's Principles, electronic spectra of polyatomic molecules emission spectra; radiative & non radiative decay. Spectra of transition metal complexes; change transfer spectra. Basic Principles Photoelectric Effect, Ionization Process: Koopman's theorem, photoelectron spectra of	Lecture Method, Videos from NPTEL

			simple molecule. Auger			
			electron spectroscopy.			
			Bragg's condition, Miller			
			indices. Debye-Scherrer			
			method for structure			
			analysis. Principal and			
			applications of neutron			
			diffraction and electron			
			diffraction			
5	06.04.2024	Till exam	Revision and Solution of			
			previous years' question			
			papers			
Departmen	ntal Meeting to	Coordinate an	d Review the Monthly comple	etion of Syllabus as per		
			lesson plans			
25 th Jan, 2024	The teachers have completed the scheduled chapters and topics as shown in the lesson					
	plan					
Departmen	Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per					
			lesson plans			
3 rd Feb,	The teachers h	nave completed	the scheduled chapters and top	ics as shown in the lesson		
2024	plan					
Departmen	ntal Meeting to	Coordinate an	d Review the Monthly comple	etion of Syllabus as per		
lesson plans						
15 th , March						
plan						
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per						
lesson plans						
8 th April,	The teachers h	nave completed	the scheduled chapters and top	ics as shown in the lesson		
2024		1	plan			
·			<u> </u>			

^{*}Any of these – (i) Lecture Method; (ii) PPT; (iii) Online Sources; (iv) Group Discussion; (v) Case Studies etc.Other Methods adopted by the teacher – Please write the specific teaching method