MCM DAV College for Women, Sector – 36A, Chandigarh Monthly Teaching Plans (Odd Semester) Session – (2022-23)

Name of the Teacher/s Dr. Nisha Dawra

Department: Chemistry

Class: M.Sc 1 (Ist semester) Subject: Inorganic Chemistry

S.No.		Date	Topics to be Covered	Academic
5.110.		onthly)	Topics to be Covered	Activity
	From	To	-	Undertaken*
1	12.09.2022	29.09.2022	VSEPR, Walsh diagrams (tri and	Lecture
_	12.03.12022	_>.0>.10	tetra-molecules), d π -p π bonds,	2000010
			Bent rule and energetics of	
			hybridization, some simple	
			reactions of covalently bonded	
			molecules.	
2	30.09.2022	14.10.2022	Limitations of crystal field theory,	Lecture
			molecular orbital theory,	
			octahedral, tetrahedral and square	
			planar complexes, π bonding and	
			molecular orbital theory.	
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus				
	T		lesson plans	
3	15.10.22	29.10.22	Stepwise and overall formation	Lecture
			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	
4	31.10.22	9.11.22	thermodynamic origin, Determination of binary formation	Lecture and group
	31.10.22	7.11.22	constants by pH	discussion
			spectrophotometry. Energy profile	discussion
			of a reaction, reactivity of metal	
			complexes,	
Departme	ental Meeting	to Coordinate ar	nd Review the Monthly completion o	f Syllabus as per
			lesson plans	_
5	10.11.22	21.11.22	Inert and labile complexes, kinetic	Lecture
			application of valance bond and	
			crystal field theories, kinetics of	
			octahedral substitution. Acid	
			hydrolysis, factors affecting acid	
			hydrolysis, Base hydrolysis,	
			conjugate base mechanism, direct	

			conjugate without cleavage	mechanism, metal-ligand		
Departme	22.11.22 ental Meeting to C	Till exams	. Substituti planar commechanism Redox reactions, electron trasphere ty reactions and inner sphere	on reactions plexes, the tra of substitution ctions, electro mechanism ansfer reaction re reaction and Marcus Huse type reaction	ans effect, n reaction, n transfer of one ons, outer s, Cross sh Theory,	Lecture and Group discussion
	intal Meeting to C		lesson plans		inpicuon o	i Synabus as per
29 th	The teachers have	ve completed	the scheduled	d chapters and	topics as sl	nown in the lesson
September, 2022	plan					
_	ental Meeting to C		nd Review th lesson plans	-	mpletion o	f Syllabus as per
21 th	The teachers have	ve completed	the scheduled	d chapters and	topics as sl	nown in the lesson
October,	plan					
2022						
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, 2022				lan		
*Any of the	se = (i) Lecture Me	thod (ii) DDT	C. (iii) Online	Sources (iv)	Group Disc	niccion: (v)

and indirect evidences in favour of

Other Methods adopted by the teacher – Please write the specific teaching method

^{*}Any of these – (i) Lecture Method; (ii) PPT; (iii) Online Sources; (iv) Group Discussion; (v) Case Studies etc.

Lesson Plan

MCM DAV College for Women, Sector – 36A, Chandigarh Monthly Teaching Plans (Odd Semester) Session – (2022-23)

Name of the Teacher: Dr. Qudrat Hundal and Dr. Renu

Department: P.G. Department of Chemistry

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

S.No.	Date (Monthly)		Topics to be Covered	Academic Activity Undertaken*
	From To			Undertaken*
1	12.09.2022	24.09.2022	Unit I Nature of Bonding in	Lecture method
			Organic molecules:	
			Fundamental concepts,	
			Delocalized chemical bonding,	
			conjugation, Cross conjugation,	
			resonance, hyper- conjugation.	
2	27.09.22	14.10.2022	Unit I Nature of Bonding in	Lecture method
			Organic molecules: Bonding in	PPT
			fullerenes, Tautomerism,	
			Aromaticity in benzenoid and	
			non-benzenoid compd.	
			Alternant and non alternant	
			hydrocarbons, Huckel's rule.	
			Energy level of π M.O.,	
			Annulenes, anti aromaticity,	
			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	

	I		treatment. The Hammett	
			equation and linear free energy	
			relationship, substituent and	
			reaction constants. Taft	
	15 10 22	20.10.22	equation.	T
3	15.10.22	29.10.22	Unit III Aliphatic Nucleophilic	Lecture method
			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, 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	31.10.22	9.11.22	Unit IV Aromatic	I a atrana na atla a d
4	31.10.22	9.11.22		Lecture method
			Electrophilic 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.	
			6	

5	10.11.22	21.11.22	Unit II Stereochemistry:	Lecture method		
	10.11.22	21.11.22	Geometrical Isomerism,	Lecture method		
			Conformational Analysis,			
			Conformation of Acyclic			
			systems, cycloalkanes, sugars			
			and decalins. Effect of			
			conformation on reactivity.			
			Steric strain due to undesirable			
			crowding of resolution.			
			Stereospecific and			
			stereospective synthesis,			
			chirality due to helical shape.			
			Stereochemistry of compounds			
			containing N,S,P			
6	22.11.22	Till exams	Revision and Solution of			
			previous years' question papers			
Departme	ntal Meetin	g to Coordinat	e and Review the Monthly comple	etion of Syllabus as per		
_			lesson plans	-		
29 th	The teach	ers have comple	eted the scheduled chapters and topi	cs as shown in the lesson		
September,			plan			
2022						
Departme	ntal Meetin	g to Coordinat	e and Review the Monthly comple	etion of Syllabus as per		
	T.		lesson plans			
21^{th}	The teach	ers have comple	eted the scheduled chapters and topi	cs as shown in the lesson		
October,			plan			
2022						
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per						
th.	T		lesson plans			
19 th	The teachers have completed the scheduled chapters and topics as shown in the lesson					
November,			plan			
2022						

^{*}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 – (2022-23)

Name of the Teacher/s: Dr. Sagarika Dev

Department: Chemistry

Class: M.Sc. I Subject-Physical Chemistry

S.No.		ate nthly)	Topics to be Covered	Academic Activity Undertaken*
	From	To		
1	12.09.2022	29.09.2022	Schrodinger wave equation to different systems,	Lecture method
2	30.09.2022	14.10.2022	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	15.10.22	29.10.22	Ordinary ang. momentum, generalized angular momentum, eigenfunctions for angular momentum, eigcuvalues of angular momentum, using ladder operators, addition of angular-momenta, spin, anti symmetry and Pauli	Lecture Method, Group discussion

			exclusion principle.	
4	31.10.22	9.11.22	Corresponding distribution laws (using Lagrange's method of undetermined multipliers) Partition functions: Translational, Rotational, Vibrational, Electronic partitions functions. Partial molal proporties, partial molal free energy, volume & heat content and their significance, Determination of these quantities, concept of fugacity and determination of	
5	10.11.22	21.11.22	Calculation of Thermodynamic properties 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.	Lecture Method, Online sources
			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	22.11.22	Till exams	Revision and Solution of previous years' question papers	etion of Syllabus as per

lesson plans						
29 th	The teachers have completed the scheduled chapters and topics as shown in the lesson					
September,	plan					
2022						
Departmen	ntal Meeting to Coordinate and Review the Monthly completion of Syllabus as per					
	lesson plans					
21 th	The teachers have completed the scheduled chapters and topics as shown in the lesson					
October,	plan					
2022						
Departmen	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					
2022						

^{*}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 – (2022-2023)

Name of the Teacher: Dr. Rishu

Department: P.G. Department of Chemistry

Class: M.Sc 1 Non-Medical Subject: Inorganic Chemistry

S.No.		ate	Topics to be Covered	Academic Activity
	(Mor	nthly)		Undertaken*
	From	To		
1	16 -01- 2023	25 -01-2023	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 Department	27.01.2023	16.02.2023	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
Departm	ental Meeting to C	oordinate and Rev	iew the Monthly completion of Syl	nabus as per lesson plans
3	17.02.2023	10.03.2023	Metal II–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, dinitrogen and dioxygen	Lecture Method and Group Discussion

			ligand.				
4	11.03.2023	18.04.2023	Metal Cluster: Higher boranes, carboranes, metallobranes and metallocarboranes, metal carbonyl and halide clusters, compounds with metal-metal multiple bonds. iew the Monthly completion of Sy.	Lecture Method and Group Discussion			
Depar tine	ental Meeting to C	oorumate and Kev	lew the Monthly completion of Sy.	nabus as per lesson plans			
25 th Jan, 2023	The teachers l	nave completed	the scheduled chapters and top plan	ics as shown in the lesson			
Departme	ental Meeting to C	oordinate and Rev	iew the Monthly completion of Sy	llabus as per lesson plans			
3 rd Feb, 2023	The teachers have completed the scheduled chapters and topics as shown in the lesson plan						
Departmo	Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans						
15 th , March 2023	The teachers have completed the scheduled chapters and topics as shown in the lesson plan						
Departmo	Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans						
8 th April, 2023	The teachers l	nave completed	the scheduled chapters and top plan	ics as shown in the lesson			
* A C 41	(*) T . 3 f .1	1 (") DDT ("") O 1	ina Caumana (iri) Chaum Diaguasian.	() G G 11 .			

^{*}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

Lesson Plan

MCM DAV College for Women, Sector – 36A, Chandigarh Monthly Teaching Plans (Even Semester) Session – (2022-23)

Name of the Teachers: 1. Dr. Madhuri Tanaji Patil

Department: P.G. Department of Chemistry

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

Tea	Date		Topics to be Covered	Academic
cher			Topics to be Covered	
Cilei	,	nthly)	-	Activity Undertaken*
	From	To	THE STATE OF THE S	
1.	16-01-2023	21.01.2023	Unit 1: Reaction Mechanism, Structure and Reactivity: Types of mechanism, types of reactions, thermodynamics and kinetic requirement. Kinetic & thermodynamics control Hammond's postulate, Curtin-Hammett Principle, Potential energy diagrams, transition states and intermediates, method of determining mechanisms, isotope effects. Addition to Carbon-Carbon Multiple Bonds Mechanistic and stereochemical aspects of addition reaction involving electrophiles, nucleophiles and free radicals, regio and chemoselectivity, orientation and reactivity. Addition to cyclopropane ring. Hydrogenation of double and triple bonds, hydrogenation of aromatic ring. Hydroboration. Michael reaction. Sharpless	Lecture method & Group discussion about Introduction to good reference books
2.	24-01-2023	30.01.2023	asymmetric epoxidation. Unit 3: Free Radical Reactions Type of free radical reactions, free radical substitution mechanism at an aromatic substrate, neighbouring group assistance.	
3.	31-01-2023	11-02-2023	Unit 2: Addition To Carbon-Heteroatom Multiple Bonds Mechanism of metal hydride reduction of saturated and unsaturated carbonyl compounds acids, esters and nitriles. Unit 2: Addition To Carbon-Heteroatom Multiple Bonds Mechanism of metal hydride reduction of saturated and unsaturated carbonyl compounds acids, esters and nitriles. Addition of grignard reagents, organozinc and organolithium reagents to carbonyl and unsaturated carbonyl compounds.	Lecture Method & Group Discussion for Importance of reaction mechanism and basics of proper structure drawing
4.	13-02-2023	26.02.2023	Unit 3: Free Radical Reactions 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.	27.02.2023	14.03.2023	Unit 2: Addition To Carbon-Heteroatom Multiple Bonds	Lecture Method & Assignments and

	1			I YYYY		
				Wittig reaction. Mechanism of condensation reactions involving enolates-Aldol, 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	class tests	
				suprafacial additions, 4n and 4n+2 systems, 2+2 addition of ketenes, 1, 3-dipolar cycloadditions and cheleotropic reactions.		
6.	6. 15.03.2023 29.03.2023		29.03.2023	Unit 3: Free Radical Reaction Coupling of alkynes and arylation of aromatic compounds by diazonium salts. Sandmeyer reaction. Free Radical Rearrangement. Hunsdiecker reaction. Unit 3: Elimination Reaction The E2, E1 and E1cB mechanisms and their spectrum, Orientation of the double bond.		
7.	31.03.2023 11.04.2023		11.04.2023	Unit 4: Pericyclic Reactions Sigmatropic rearrangements-Suprafacial and antarafacial shifts of H. Sigmatropic shifts involving carbon moieties, [3, 3]-and [5, 5]-sigmatropic rearrangements. Claisen, Cope and aza-Cope rearrangement. Fluxional tautomerism. Ene reaction.	Lecture method & Group discussion Revision and paper solving	
8.	12.04	1.2023	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	partmei	ntal Mee	ting to Coordina	te and Review the Monthly completion of Sylesson plans	yllabus as per	
Jan	27 th nuary, 023	The tea	achers have comp	leted the scheduled chapters and topics as show plan	wn in the lesson	
		ntal Mee	ting to Coordina	te and Review the Monthly completion of S	yllabus as per	
2	2 nd	The	ahara hava aar	lesson plans	vn in the lessen	
Feb	ruary, 023	ine tea	deners have comp	leted the scheduled chapters and topics as show plan	wii iii the lesson	
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans						
Ma	21 th The teachers have completed the scheduled chapters and topics as shown in the lesson plan 2023					
De	Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans					
20	April, 023		-	leted the scheduled chapters and topics as show plan		
- A	0.1	/ · · · ·		DDE (11) 0 11 0 (1) 0 D1		

^{*}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

Lesson Plan

Mehr Chand Mahajan D.A.V. College for Women, Sector – 36A, Chandigarh Monthly Teaching Plans (Even Semester) Session –2022-2023

Name of the Teacher: Dr. Nisha Dawra

Department: Chemistry

Class: M. Sc. Chemistry 1 (2nd Semester) Subject: Physical Chemistry (CH-

423)

S. No.	Date		Topics to be Covered	Academic Activity
	(Mon	thly)		Undertaken*
	From	To		
1.	16-01-2023	07.02.2023	Unit-1: Chemical Dynamics:	Lecture, PPT
			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.	4-
Departmenta	al Meeting to Coor	dinate and Revie	w the Monthly completion of Syllabus as 2023	per lesson plans on 17 th Jan,
2.	08-02-2023	15-03-2023	Unit 1: Chemical Dynamics:	Lecture, Online
			Photochemical (H ₂ -Cl ₂) reactions	sources
			& oscillatory reactions	2 3 3 2 3 2 3 3 2
			(Belousov-Zhabotinsky reaction),	
			homogeneous catalysis, kinetics	
			of enzyme reactions, general	
			features of fast reactions, Study	
			of fast reactions by flow method,	
			relaxation method, flash	

Departmenta	al Meeting to Coor	dinate and Revie	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 concentration (CMC), factors affecting CMC, counter ions binding to micelles, thermodynamics of micellization-phase separation, mass action models, solubilization, microemulsions, reverse micelles w the Monthly completion of Syllabus as 2023	per lesson plans on 3 rd Feb,
3.	16-03-2023	08-04-2023	Unit 1: Chemical Dynamics: Dynamics of unimolecular reaction (Lindemann-Hinshelwood and Rice-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,	Lecture, group discussion and seminar

			7				
			Lipmann equations, Methods of				
			determining structures of				
			electrified interface, Guoy-				
			Chapmann, Stern Over				
D. (- A-IMC 4 C		potentials.	111			
Departme	Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 15 th , March 2023						
4.	11-04-2023	20.04.2023	Unit 2: (a) Non-equilibrium	Lecture, group			
			Thermodynamics:	discussion and			
			Diffusion, electrical conduction,				
			irreversible thermodynamics for	seminar			
			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.				
Departme	ental Meeting to C	oordinate and Re	view the Monthly completion of Syllabus	as per lesson plans on 8 th			
			April, 2023				
5.	21-04-2023	Till Exams	Unit 2: (b) Macromolecules:	Lecture			
			Chain configuration of	Docture			
			macromolecules, calculation of				
			average dimensions.				
			Unit 4: Electrochemistry				
			Introduction to corrosion,				
			homogeneous theory, forms of				
			corrosion, corrosion monitoring.				
	(I) Y 3 7 1		Online Sources: (iv) Group Discussion: (v) (~ ~			

^{*}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 – (2022-23)

Name of the Teacher/s: <u>Dr. Sagarika Dev</u>

Department: Chemistry

Class_M.Sc. I Subject: <u>Group Theory and spectroscopy</u>

S.No.	Date (Monthly)		Topics to be Covered	Academic Activity Undertaken*	
1	From 16.01.2023	To 25.01.2023	Symmotry alamanta &	Lasture method DDT	
1	10.01.2023	23.01.2023	Symmetry elements & symmetry operation, definitions of group, subgroup, relation between orders of a finite group & its sub groups. Point group symmetry.	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	27.01.2023	16.02.2023	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 there use-in spectroscopy.	Lecture method, PPT, Videos from NPTEL	

	1		1	
3	17.02.2023	10.03.2023	Infrared Spectroscopy:- Linear Harmonic Oscillator, Vibrational energy of diatomic molecule zero point energy, force constants & bond lengths anharmonicity, morse potential energy diagram. Vibrational rotational 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 Nuclear Magnetic	Lecture Method, Online
3	17.02.2023	10.03.2023	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	Lecture Method, Online Sources
			affecting 'g' value. Measurements, techniques, applications. Nuclear Quadrupole Resonance spectroscopy:- Quadrupole Nuclear moments, electic field gradient complex constants applications	

4	11.03.2023	12.04.2023	Energy levels, molecular	Lecture Method, Videos	
			orbital, Frank Condon's	from NPTEL	
			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 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	17.04.2022	Till exams	Revision and Solution of		
			previous years' question		
D	-4-1 N/I4: 4-	C1:4	papers	-4'£C-11-1	
Departmen	ntal Meeting to		d Review the Monthly complesson plans	letion of Synabus as per	
25 th Jan, 2023	The teachers h		the scheduled chapters and top	pics as shown in the lesson	
			plan		
Departmen	ntal Meeting to		d Review the Monthly complesson plans	etion of Syllabus as per	
3 rd Feb,	The teachers have completed the scheduled chapters and topics as shown in the lesson				
2023			plan		
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans					
15 th , March	The teachers h	nave completed	the scheduled chapters and top	oics as shown in the lesson	
2023	plan				
Departmen	ntal Meeting to		d Review the Monthly complesson plans	etion of Syllabus as per	
Oth A21	771 4. 1 1				
8 th April, 2023	ine teachers i	nave completed	the scheduled chapters and top	oics as snown in the lesson	
	(i) I antonia Mathad	I. (::) DDT. (:::) O1	plan ine Sources: (iv) Group Discussion:	() C C	

^{*}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