

TEACHING PLAN

Semester	Paper	Unit/Topic		Teacher	No. of Lectures	To be Coverd
Semester-I	CC-1 : ORGANIC CHEMISTRY-I	Basics of Organic Chemistry				
		Bonding and Physical Properties .	Valence Bond Theory	Madhumita Midya	30	1 st Month
			Electronic Displacements			2 nd Month
			MO Theory			3 rd Month
			Physical Properties			4 th Month
		General Treatment of Reaction Mechanism I	Mechanistic Classification: Ionic, radical, and pericyclic.			4 th Month
			Reaction Type			5 th Month
			Reactive Intermediate			5 th Month
		Stereochemistry I	Bonding geometry of carbon compounds and representation of molecules	Chaitali Basu	20	1 st Month
			Concept of chirality and symmetry			2 nd Month
			Relative and absolute configuration			3 rd Month
			Optical activity of chiral compounds			4 th Month
	CC1P1-	ORGANIC CHEMISTRY LAB-I	Separation	Madhumita Midya	41	1 st Month
			Identification of a pure organic compounds			2 nd , 3 rd and 4 th Month
			Determination of boiling point			Chaitali Basu
	CC-2 : PHYSICAL CHEMISTRY-I	Kinetic theory and Gaseous state	Kinetic theory of gases	Biswarup Mondal	60	1 st Month
			Maxwell's distribution of speed and energy			2 nd Month
			Real gas and virialequation			2 nd Month
		Chemical Thermodynamics	Zeroth and 1 st law of Thermodynamics			3 rd Month
			Thermochemistry			3 rd Month
2 nd law of Thermodynamics			4 th Month			
Chemical kinetics		Rate law ,order and molecularity role of T and theories of reaction rate.	4 th Month			
		Homogeneous catalysis	5 th Month			
		Autocatalysis; periodic reactions.	5 th Month			
CC2P2 :	CHEMISTRY LAB-II	Experiment-1: Determination of pH of unknown solution			1 st Month	

			(buffer), by colormatching method	Biswarup Mondal	10	
			Experiment -2 : Determination of heat of neutralization of a strong acid by a strong base.			2 nd Month
			Experiment-3 : Study of kinetics of acid-catalyzed hydrolysis of methyl acetate.			3 rd Month
			Experiment-4: Study of kinetics of decomposition of H ₂ O ₂			4 th Month
			Experiment-5 : Determination of heat of solution of oxalic acid from solubility measurement.			5 th Month
GE-1	Inorganic Chemistry -I		Atomic Structure	Anwesha Jana	16	1 st Month
			Chemical periodicity			2 nd Month
			Acids and bases			3 rd Month
			Redox reactions			4 th Month
	Organic Chemistry-I		Fundamental of Organic Chemistry	Madhumita Midya	12	1 st Month
			Nucleophilic substitution and elimination reactions			2 nd Month
			Aliphatic hydrocarbons	Chaitali Basu	21	1 st Month
			Alkanes			1 st Month
			Alkenes			2 nd Month
			Alkynes			2 nd Month
	Reactions	3 rd Month				
	Stereochemistry	4 th and 5 th Month				
GE-1P1: LAB	Inorganic Chemistry-Lab		Estimation of Sodium carbonate and Sodium hydrogen carbonate present in a mixture	Anwesha Jana	10	2 nd month
			Estimation of oxalic acid by titrating it with KMnO ₄			2 nd month
			Estimation of Fe (II) ions by titrating it with K ₂ Cr ₂ O ₇			3 rd month

			Estimation of Cu(II) ions Iodometrically using $\text{Na}_2\text{S}_2\text{O}_3$			3 rd month	
			Estimation of Water of Crystallisation in Mohr's Salt by titrating with KMnO_4			4 th month	
		Organic Chemistry-Lab	Experiment A : Detection of special elements (N, Cl, and S) in organic compounds.	Madhumita Midya	6	2 nd Month	
			Experiment B : Solubility and Classification (Solvents : H_2O , dil.HCl , dil.NaOH)			3 rd Month	
			Experiment C: Detection of Functional groups: Aromatic- NO_2 , Aromatic- NH_2 , -COOH, carbonyl(no distinction of $-\text{CHO}$ and $>\text{C}=\text{O}$ needed), phenolic -OH, in solid organic compounds.			4 th Month	
Semester - II	CC-3	Inorganic Chemistry - I	Extra nuclear Structure of atom	Anwesha Jana	6	1 st & 2 nd Month	
			Chemical Periodicity			4	3 rd Month
			Acid – Base reactions			4	3 rd & 4 th Month
			Redox reaction and precipitation reactions			5	4 th Month
	C3P:	Inorganic Chemistry (LAB)	Acid and Base Titrations	Anwesha Jana	6	1 st , 2 nd and 3 rd Month	
			Oxidation – Reduction Titrimetric			6	1 st , 2 nd and 3 rd Month
CC-4T :ORGANIC CHEMISTRY -II	Stereo Chemistry-II	Chirality arising out of stereoaxis.	Chaitali Basu	16	1 st Month		
		Concept of prostereoisomerism.			2 nd and 3 rd Month		
		Conformation:			4 th Month		
		Conformational analysis.			4 th Month		

		General Treatment of Reaction Mechanism II	Reaction Thermodynamics.	Madhumita Midya	34	1 st Month		
			Concept of organic acids and Bases.			1 st Month		
			Tautomerism.			2 nd Month		
			Reaction Kinetics.			2 nd Month		
		Substitution and Elimination Reactions.	Free radical substitution reaction.			3 rd Month		
			Nucleophilic substitution reactions.			3 rd and 4 th Month		
			Elimination reactions.			4 th and 5 th Month		
	CC-4P:	ORGANIC CHEMISTRY -LAB	Organic preparations	Madhumita Midya	20	1 st , 2 nd , 3 rd Month		
			Purification of crude product			1 st , 2 nd , 3 rd Month		
			Melting point	Chaitali Basu	7	1 st , 2 nd , 3 rd Month		
	GE-2	PHYSICAL CHEMISTRY-I	Kinetic theory of gases and real gases	Biswarup Mondal	20	1 st and 2 nd Month		
			Liquids			3 rd Month		
			Solids			4 th Month		
Chemical kinetics			5 th Month					
Inorganic Chemistry -II		Chemical Bonding & Molecular Structures	Anwesha Jana	10	4 th & 5 th Month			
	Comperativestudy of p- block elements:		8	2 nd and 3 rd Month				
GE-2P-LAB	Physical Chemistry-Lab	Surface tension measurement.	Biswarup Mondal	6	1st Month			
		Viscosity measurement.			2 nd Month			
		Study the kinetics of the following reactions.			3 rd Month			
	Inorganic Chemistry- LAB	Qualitative Semimicro analysis of mixtures containing three radicals	Anwesha Jana	8	2 nd and 3 rd Month			
Semester – III	CC-5 : PHYSICAL CHEMISTRY-II	Transport Processes	Fick's law		10	1 st Month		
			Viscosity			1 st Month		
			Conductance and transport number.			1 st Month		
		Applications of Thermodynamics-I	partial properties and chemical potential.				14	2 nd Month
			Chemical equilibrium.					2 nd Month

			Nernst's distribution law	Biswarup Mondal		2 nd Month	
			Chemical potential and other properties of ideal substances-pure and mixtures				3 rd Month
			Condensed phase				3 rd Month
		Foundation of Quantum Mechanics.	Beginning of quantum mechanics		12		4 th Month
			Wave function				4 th Month
			Concept of operator				4 th Month
			Perticle in a box				5 th Month
			Simple harmonic oscillator				5 th Month
CC-5P:	PHYSICAL CHEMISTRY-II LAB.	Experiment 1: Study of viscosity of unknown liquid (glycerol , sugar) with respect to water	Biswarup Mondal	12		1 st Month	
		Experiment 2: Determination of partition coefficient for the distribution of 12 between water and CCl ₄ .					1 st Month
		Experiment 3: Determination of Keq for KI+I ₂ =KI ₃ using partition coefficient between water and CCl ₄ .					2 nd Month
		Experiment 4: Conductometric titration of an acid (strong ,weak /monobasic , dibasic) against strong base.					2 nd Month
		Experiment 5: Study of saponification reaction conductometrically.					3 rd Month
		Experiment 6: Verification of Ostwald's dilution law and determination of Ka of weak acid.					4 th Month
C6T	Inorganic Chemistry-II	Chemical Bonding-I			Anwesha Jana	8	
		Chemical Bonding-II	8			2 nd and 3 rd month	
		Radioactivity	4			4 th month	

C6P	Inorganic Chemistry-II LAB	Iodo/ Iodimetric Titrations	Anwesha Jana	8	2 nd and 3 rd month
		Estimation of metal content in some selective samples		6	4 th month
CC-7T: ORGANIC CHEMISTRY-III	Chemistry of Alkenes and Alkynes	Addition to C=C	Madhumita Midya	25	1 st Month
		Addition to C-C triple bond (in comparison to C=C)			2 nd Month
		Aromatic Substitution			3 rd Month
		Nucleophilic aromatic substitution			4 th Month
	Carbonyl and related compounds	Addition to C=O	Chaitali Basu	23	2 nd Month
		Exploitation of acidity of alpha-Hof C=O			3 rd Month
		Elementary ideas of green chemistry			3 rd Month
		Nucleophilic addition to alpha, beta- unsaturated carbonyl system			4 th Month
	Organometallics			5 th Month	
CC-7P	ORGANIC CHEMISTRY-III - LAB	Qualitative analysis of single solid organic compounds.	Madhumita Midya	25	1 st , 2 nd , 3 rd and 4 th
SEC-1T:	PHARMACEUTICAL CHEMISTRY	Drugs and pharmaceuticals.	Madhumita Midya	10	1 st and 2 nd Month
		Fermentation	Chaitali Basu	6	2 nd Month
SEC-1P:	PHARMACEUTICAL CHEMISTRY-LAB	Preparation of Aspirine and its analysis	Madhumita Midya	2	1 st Month
		Preparation of Magnesium bisilicate(Antacid)	Chaitali Basu	2	2 nd Month
GE-3T	Physical chemistry-II				
	Organic chemistry-II	Aromatic hydrocarbons	Madhumita Midya	13	1 st Month
		Aryl halides			2 nd Month
		Alcohols, phenols, and ethers.			3 rd and 4 th Month
		Carbonyl compounds	Chaitali Basu	11	1 st and 2 nd Month
Organometallic compounds			3 rd Month		
GE-3P	Physical Chemistry-Lab				

		Organic Chemistry-Lab	Identification of a pure organic compounds.	Madhumita Midya	12	2 nd , 3 rd , and 4 th Month
Semester-IV	C8T: PHYSICAL CHEMISTRY-III	Application of Thermodynamics-II	Colligative properties	Biswarup Mondal	38	1 st Month
			Phase rule			1 st Month
			Binary solutions			2 nd Month
		Electrical Properties of Molecules	Ionic equilibria			2 nd Month
			Electromotive force			3 rd month
			Dipole moment and polarizability			3 rd month
		Quantum Chemistry	Angular momentum			4 th Month
			Qualitative treatment of hydrogen atom and hydrogen-like ions			4 th Month
			LCAO and HF-SCF			5 th Month
C8P	PHYSICAL CHEMISTRY-LAB		Experiment 1: Determination of solubility of sparingly soluble salt in water, in electrolyte with common ions and in natural electrolyte (using common indicator)	Biswarup Mondal	12	1 st Month
			Experiment 2: Potentiometric titration of Mohr's salt solution against standard K ₂ Cr ₂ O ₇ solution.			2 nd Month
			Experiment 3: Determination of K _{sp} for AgCl by potentiometric titration of AgNO ₃ solution against standard KCl solution.			2 nd Month
			Experiment 4: Effect of ionic strength on the rate of persulphate- Iodide reaction.			3 rd Month
			Experiment 5: Study of phenol-water phase diagram			3 rd Month
			Experiment 6: Ph metric titration of acid (mono and di-basic) against strong base.			4 th Month

C9T	Inorganic Chemistry - III	General Principles of Metallurgy	Anwesha Jana	4	2 nd and 3 rd month
		Chemistry of s and p Block Elements		16	2 nd and 3 rd month
		Noble Gases			
		Inorganic Polymers		16	2 nd month
		Coordination Chemistry-I			3 rd month
C9P	Inorganic Chemistry – III LAB	Complexometric Titration	Anwesha Jana	10	2 nd and 3 rd month
		Inorganic preparations		10	2 nd and 3 rd month
CC-10T: ORGANIC CHEMISTRY-IV	Nitrogen Compounds	Amines: Aliphatic & Aromatic.	Chaitali Basu	27	1 st Month
		Nitro compounds: Aliphatic & aromatic			2 nd Month
		Alkyl nitrile and isonitrile			2 nd Month
		Diazonium salts and their related compounds			3 rd Month
	Organic Spectroscopy	UV spectroscopy		3 rd Month	
		IR spectroscopy		4 th Month	
		NMR spectroscopy		5 th Month	
	Rearrangements	Rearrangement to electro-deficient carbon	Madhumita Midya	25	1 st Month
		Rearrangement to electro-deficient nitrogen			1 st Month
		Rearrangement to electro-deficient oxygen			2 nd Month
		Aromatic rearrangements			2 nd Month
		Rearrangement reactions by green approach			3 rd Month
		The Logic of Organic Synthesis			4 th Month
	The Logic of Organic Synthesis	Retro synthesis analysis		4 th Month	
Strategy of ring synthesis			4 th Month		
Asymmetric synthesis			5 th Month		
CC-10P		Estimation of glucose by titration	Madhumita Midya	12	2 nd Month

	ORGANIC CHEMISTRY-IV-LAB	using Fehling's solution			
		Estimation of sucrose by titration using Fehling's solution			2 nd Month
		Estimation of aromatic amine (aniline) by bromination (Bromate-Bromide) method			3 rd Month
		Estimation of phenol by bromination (Bromate-Bromide)			3 rd Month
		Estimation of formaldehyde (Formalin)			4 th Month
		Estimation of saponification value of oil/fat/ester			4 th Month
		Estimation of glycine by Sørensen's formol method	Chaitali Basu	8	2 nd Month
		Estimation of vitamin-C (reduced)			3 rd Month
		Estimation of acetic acid in commercial vinegar			3 rd Month
		Estimation of urea (hypobromite method)			4 th Month
SEC-2T		Chemistry of Cosmetics & Perfumes.	Madhumita Midya	22	1 st , 2 nd , 3 rd and 4 th Month
SEC-2P		Preparation of talcum powder	Chaitali Basu	6	2 nd Month
		Preparation of hair remover			2 nd month
		Preparation of face cream			3 rd Month
		Preparation of shampoo	Madhumita Midya	8	3 rd Month
		Preparation of enamels			3 rd Month
		Preparation of nail polish and nail polish remover.			4 th Month
GE4T	Physical Chemistry-III	Solutions	Biswarup Mandal	13	1 st Month
		Phase Equilibria			1 st Month
		Conductance			2 nd Month
		Electromotive Force			3 rd Month
		Chemical analysis	Anwasha Jana	10	2 nd Month

		Analytical and Environmental Chemistry	Environmental chemistry			3 rd Month
	GE4P	PRACTICAL	Distribution law	Biswarup Mandal	10	2 nd Month
			Phase equilibria			3 rd Month
			Conductance			3 rd Month
			Potentiometry			4 th Month
			Analytical and Environmental Chemistry- LAB	Anwasha Jana	4	3 rd And 4 th Month
Semester-V	C11T	Inorganic Chemistry - IV	Coordination Chemistry -II	Anwasha Jana	20	2 nd and 3 rd month
			Transition Elements		6	3 rd month
			Lanthanoids Actinoids		4	4 th month
	C11P	Inorganic Chemistry- LAB	Chromatography of metal ions	Anwasha Jana	10	1 st Month
			Gravimetry			2 nd Month
			Spectrophotometry			3 rd Month
	CC-12T	ORGANIC CHEMISTRY-V	Carbocycles and Heterocycles	Chaitali Basu	18	1 st and 2 nd Month
			Bio-molecules			3 rd And 4 th Month
			Cyclic Stereochemistry	Madhumita Midya	27	1 st Month
			Pericyclic reactions			2 nd and 3 rd Month
			Carbohydrates			4 th and 5 th Month
	CC-12P	ORGANIC CHEMISTRY-LAB	Chromatographic Separations	Chaitali Basu	6	2 nd and 3 rd Month
			Spectroscopic Analysis of Organic Compounds	Madhumita Midya	6	3 rd and 4 th Month
	DSE-1T	ADVANCE PHYSICAL CHEMISTRY	Crystal structure	Biswarup Mandal	20	1 st and 2 nd Month
			Statistical thermodynamics			3 rd and 4 th Month
			Special selected topics			5 th Month
DSE-1P	ADVANCE PHYSICAL CHEMISTRY	Programming		10	1 st , 2 nd and 3 rd Month	
DSE-2T		Qualitative and quantitative aspects of analysis	Madhumita Midya	17	1 st and 2 nd Month	
		Optical methods of analysis			3 rd Month	
		Thermal methods of analysis	Biswarup Mondal	20	2 nd Month	
		Electroanalytical methods			3 rd Month	

			Separation techniques			4 th Month
	DSE-2P		Separation Techniques	Madhumita Midya	16	2 nd Month
			Solvent Extractions			3 rd Month
			Spectrophotometry	Biswarup Mandal	8	2 nd and 3 rd Month
SEMESTER-VI	C13T	Inorganic Chemistry - IV	Organometallic Chemistry	Anwesha Jana	12	2 nd and 3 rd month
			Bioinorganic Chemistry		12	2 nd and 3 rd month
			Catalysis by Organometallic Compounds		4	2 nd and 3 rd month
			Reaction Kinetics & Mechanism		4	1 st and 2 nd Month
	C13P	Inorganic Chemistry - LAB	Qualitative Semi micro Analysis of mixtures containing four radicals. Emphasis should be given to the understanding of the chemistry of different reactions and to assign the most probable composition	Anwesha Jana	20	1 st , 5 th Month
	CC-14T:	PHYSICAL CHEMISTRY-V	Molecular Spectroscopy	Biswarup Mondal	35	1 st and 2 nd Month
			Photochemistry			3 rd Month
Surface phenomenon			4 th and 5 th Month			
CC-14P	PHYSICAL CHEMISTRY-LAB	Practical	Biswarup Mondal	12	1 st , 2 nd and 3 rd Month	
DSE-3T	Green Chemistry	Introduction to Green Chemistry	Chaitali Basu	30	1 st Month	
		Principles of Green Chemistry and Designing a Chemical synthesis			2 nd and 3 rd Month	
		Examples of Green Synthesis/ Reactions and some real world cases			4 th Month	
		Future Trends in Green Chemistry			5 th Month	

	DSE-3P	Green Chemistry-Lab	Practical	Chaitali Basu	12	1 st , 2 nd and 3 rd Month
	DSE-4T	POLYMER CHEMISTRY	Introduction and history of polymeric Materials	Madhumita Midya	30	1 st Month
Functionality and its importance			1 st Month			
Kinetics of polymerization			2 nd Month			
Crystallisation and crystallinity			3 rd Month			
Nature and structure of polymers.			3 rd Month			
Determination of molecular weight of polymers			4 th Month			
Glass transition temperature (Tg) and determination of Tg			4 th Month			
Polymer solution			5 th Month			
Properties of polymer			5 th Month			
			DSE-4P			POLYMER CHEMISTRY-LAB
Polymer characterization	4 th Month					
Polymer analysis	5 th Month					