2020-2021

Lesson Plan for CBCS system: Department of Chemistry !

Semester	Progr a -mme	Course and Name of the Paper	Topic	Teacher	No. Of hours
1	Hons	CC1-1-TH: INORGANIC CHEMISTRY-1, ORGANIC CHEMISTRY-1A	Extra nuclear Structure of atom	SB	14
			Acid-Base reactions	SB+SG	6+6
			Redox reactions	SG	14
			Basics of Organic Chemistry: Bonding and Physical Properties	PR	18
			General Treatment of Reaction Mechanism I	PR	2
		CC1-1-P	INORGANIC CHEMISTRY: I (1) LAB: Acid and Base Titrations and Oxidation-Reduction Titrations	SB	30
			ORGANIC CHEMISTRY: O (1A) LAB: Separation based upon solubility	PR	15
		Total number of hours for CC 1-1 (Theory+Practical)			60T + 45P
		CC1-2-TH: PHYSICAL CHEMISTRY-1, ORGANIC CHEMISTRY-1B	Kinetic Theory and Gaseous state	IS	20
			Transport processes	IS	8
			Chemical kinetics	IS	12
			Stereochemistry I	PR	17
			General Treatment of Reaction Mechanism II	PR	3
		CC1-1-P	PHYSICAL CHEMISTRY: P (1) LAB	IS	30
			ORGANIC CHEMISTRY: O (1B) LAB: Determination of boiling point of common organic liquid compounds	PR	15
		Total number of hours for CC 1-2 (Theory+Practical)			60T + 45P
	Gen	CC1/GE1 TH	Kinetic Theory of Gases and Real gases	IS	7
			Liquids	IS	6
			Chemical Kinetics	IS	7
			Atomic Structure	SB	7
			Chemical Periodicity	SG	7
			Acids and bases	SB+SG	3+3
			Fundamentalsof Organic Chemistry	PR	7
			Stereochemistry	PR	7
			Nucleophilic Substitution and Elimination Reactions	PR	6
		CC1/GE1 P	1. Estimation of sodium carbonate and sodium hydrogen carbonate present in a mixture.	AS+IS+SG +MK	45

			2. Estimation of oxalic acid by titrating it with $KMnO_4$. 3. Estimation of water of crystallization in Mohr's salt by titrating with $KMnO_4$. 4. Estimation of Fe (II) ions by titrating it with $K_2Cr_2O_7$ using internal indicator. 5. Estimation of Cu (II) ions iodometrically using $Na_2S_2O_3$. 6.Estimation of Fe(II) and Fe(III) in a given mixture using $K_2Cr_2O_7$ solution.		
		Total number of hours for CC-1/GE-1 (Theory+Practical)			60T + 45P
2	Hons	CC-2-3-TH ORGANIC CHEMISTRY-2	Stereochemistry II	PR	20
			General Treatment of Reaction Mechanism III	PR	20
			Substitution and Elimination Reactions	PR	20
		CC-2-3-P	Organic Preparations, Purification and Melting point of the purified product	PR	45
		Total number of hours for CC 2-3 (Theory+Practical)			60T + 45P
		CC-2-4-TH INORGANIC CHEMISTRY-2	Chemical Bonding-I	SG	20
			Chemical Bonding-II	SB	30
			Radioactivity	SG	10
		CC-2-4-P	Iodo-/ Iodimetric Titrations, Estimation of metal content in some selective samples	SB	45
		Total number of hours for CC 2-4 (Theory+Practical)			60T + 45P
	Gen	CC/GE 2 TH	Chemical Thermodynamics	IS	8
			Chemical Equilibrium:	IS	7
			Solutions	Is	5
			Phase Equilibria	IS	5
			Solids	IS	5
			Aliphatic Hydrocarbons	PR	10
			Error Analysis and Computer Applications	SG	10
			Redox reactions	SG	10
		CC/GE 2 P	1. Study of kinetics of acid-catalyzed hydrolysis of methyl acetate 2. Study of kinetics of decomposition of H_2O_2 (Clock Reaction) 3. Study of viscosity of unknown liquid (glycerol, sugar) with respect to water.	AS+IS+SG +MK	45

			4. Determination of solubility of sparingly soluble salt in water, in electrolyte with common ions and in neutral electrolyte (using common indicator) 5. Preparation of buffer solutions and find the pH of an unknown buffer solution by colour matching method 6. Determination of surface tension of a liquid using Stalagmometer		
		Total number of hours for CC-2/GE-2 (Theory+Practical)			60T + 45P
3	HONS	CC-3-5-TH PHYSICAL CHEMISTRY-2	Chemical Thermodynamics I	IS	10
			Chemical Thermodynamics II	IS	20
			Applications of Thermodynamics – I	Is	6
			Electrochemistry	AS	24
		CC-3-5-P	1. Conductometric titration of an acid (strong, weak/ monobasic, dibasic, and acid mixture) against strong base. 2. Study of saponification reaction conductometrically 3. Verification of Ostwald's dilution law and determination of Ka of weak acid 4. Potentiometric titration of Mohr's salt solution against standard $K_2Cr_2O_7$ and $KMnO_4$solution 5. Determination of Ksp for AgCl by potentiometric titration of $AgNO_3$ solution against standard KCl solution 6. Determination of heat of neutralization of a strong acid by a strong base		45
		Total number of hours for CC 3-5 (Theory+Practical)			60T + 45P
		CC-3-6-TH INORGANIC CHEMISTRY-3	Chemical periodicity	SG	15
			Chemistry of s and p Block Elements	SG	15
			Noble Gases, Inorganic Polymers	SB	15
			Coordination Chemistry-I	SB	15
		CC-3-6-P	Complexometric titration, Chromatography of metal ions, Gravimetry	SG	45
		Total number of hours for CC 3-6 (Theory+Practical)			60T + 45P
		CC-3-7-TH	Chemistry of alkenes and alkynes	PR	15
			Aromatic Substitution	PR	10

		ORGANIC CHEMISTRY-3	Carbonyl and Related Compounds	PR	30
			Organometallics	PR	5
		CC-3-7-P	A. Identification of a Pure Organic Compound Solid compounds: oxalic acid, tartaric acid, citric acid, succinic acid, resorcinol, urea, glucose, cane sugar, benzoic acid and salicylic acid Liquid Compounds: formic acid, acetic acid, methyl alcohol, ethyl alcohol, acetone, aniline, dimethylaniline, benzaldehyde, chloroform and nitrobenzene B. Quantitative Estimations of glycine, glucose, sucrose, aniline, acetic acid in vinegar, urea, saponification value of oil.	PR	45
		Total number of hours for CC 3-7 (Theory+Practical)			60T + 45P
		SEC(A)-3-2-TH ANALYTICAL CLINICAL BIOCHEMISTRY	Carbohydrates, Proteins, Enzymes	AS	10
			Lipids, Lipoproteins	AS	10
			Biochemistry of disease: A diagnostic approach by blood/ urine analysis	As	10
		Total number of hours for SEC(A)-3-2-TH			30T
	Gen	CC/GE 3 TH	Chemical Bonding : Ionic and covalent bonding	SG	10
			Chemical Bonding : MO Approach	SB	5
			Comparative study of p-block elements	SG	5
			Transition Elements (3d series and Lanthanoids and actinoid)	SB	5
			Coordination Chemistry	SB	5
			Electrochemistry: Ionic Equilibria		5
			Conductance, Electromotive force		10
			Aromatic Hydrocarbons, Organometallic Compounds, Aryl Halides	PR	15
		CC 3/GE 3 P	Qualitative semimicro analysis of mixtures containing two inorganic radicals.	SB+AS+IS +MK	45
		Total number of hours for CC-3/GE-3 (Theory+Practical)			60T + 45P
		SEC(A)-3-1-TH Basic Analytical Chemistry	Introduction to Analytical Chemistry, Chromatography, Ion-exchange, Suggested Applications, Suggested Instrumental demonstrations	SG	15

			Analysis of soil, Analysis of water, Analysis of food products, Analysis of cosmetics	IS	15
		Total number of hours for SEC(A)-3-1-TH			30T
4	HONS	CC-4-8-TH ORGANIC CHEMISTRY-4	Nitrogen compounds	PR	12
			Rearrangements	PR	14
			The Logic of Organic Synthesis	PR	14
			Organic Spectroscopy	PR	20
		CC-4-8-P	Qualitative Analysis of Single Solid Organic Compounds	PR	45
		Total number of hours for CC 4-8 (Theory+Practical)			60T + 45P
		CC-4-9-TH PHYSICAL CHEMISTRY-3	Application of Thermodynamics – II: Colligative properties	IS	10
			Phase Equilibrium	IS	10
			Foundation of Quantum Mechanics	AS	25
			Crystal Structure	AS	15
		CC-4-9-P	1. Kinetic study of inversion of cane sugar using a Polarimeter (Preferably Digital) 2. Study of Phase diagram of Phenol-Water system. 3. Determination of partition coefficient for the distribution of I2 between water and CCl_4 4. Determination of pH of unknown solution (buffer), by colour matching method 5. pH-metric titration of acid (mono- and di-basic) against strong base 6. pH-metric titration of a tribasic acidagainst strong base.	IS	45
		Total number of hours for CC 4-9 (Theory+Practical)			60T + 45P
		CC-4-10-TH INORGANIC CHEMISTRY-4	Coordination Chemistry-II	SB	22
			d-d transitions; L-S coupling; qualitative Orgel diagrams… …charge transfer spectra	SG	8
			Chemistry of d- block elements	SB	8
			Chemistry of f- block elements	SG	7
			Inorganic Reaction Kinetics and Mechanism	SG	15
		CC-4-10-P	Inorganic preparations, Instrumental Techniques: 1. Measurement of 10Dq by spectrophotometric method. 2. Determination of λ_{max}	SG	45

		Total number of hours for CC 4-10 (Theory+Practical)			60T + 45P
		SEC(B)-4-1-TH PHARMA-CEUTICALS CHEMISTRY	Drugs & Pharmaceuticals, Drug discovery, design and development; Basic Retrosynthetic approach.	PR	10
			Synthesis of the representative drugs of the following classes: analgesics agents, antipyretic agents, antiinflammatory agents; antibiotics; antibacterial and antifungal agents; antiviral agents, Central Nervous System agents, Cardiovascular, antilaprosy, HIV-AIDS related drugs.	PR	10
			Fermentation		10
		Total number of hours for SEC(B)-4-1-TH			30T
	GEN	CC 4/GE 4 TH	Alcohols, Phenols and Ethers, Carbonyl Compounds, Carboxylic Acids and Their Derivatives, Amines and Diazonium Salts, Amino Acids and Carbohydrates	PR	20
			Crystal Field Theory	SB	20
			Quantum Chemistry & Spectroscopy		20
		CC 4/GE 4 P	1.Qualitative Analysis of Single Solid Organic Compound 2. Identification of a pure organic compound	SB+AS+IS +MK	45
		Total number of hours for CC-4/GE-4 (Theory+Practical)			60T + 45P
		SEC(B)-4-3-TH PHARMA-CEUTICALS CHEMISTRY	Drugs & Pharmaceuticals Drug discovery, design and development; Basic Retrosynthetic approach.	PR	10
			Synthesis of the representative drugs	PR	10
			Fermentation	SG	10
		Total number of hours for SEC(B)-4-1-TH			30T
5	HONS	CC-5-11-TH PHYSICAL CHEMISTRY-4	Quantum Chemistry II	AS	30
			Statistical Thermodynamics	AS	20
			Numerical Analysis	IS	10
		CC-5-11-P	Computer programs(Using FORTRAN or C or C ++) based on numerical methods	AS	45
		Total number of hours for CC-5-11 (Theory+Practical)			60T + 45P
		CC-5-12-TH	Carbocyles and Heterocycles	PR	16

		ORGANIC CHEMISTRY-5	Cyclic Stereochemistry	PR	10
			Pericyclic reactions	PR	8
			Carbohydrates	PR	14
			Biomolecules	PR	12
		CEMA-CC-5-12-P	A. Chromatographic Separations B. Spectroscopic Analysis of Organic Compounds	Pr	45
		Total number of hours for CC-5-12 (Theory+Practical)			60T + 45P
		DSE(A)-5-2-TH APPLICATIONS OF COMPUTERS IN CHEMISTRY	Computer Programming Basics (FORTRAN)	AS	20
			Introduction to Spreadsheet Software(MS Excel)	AS	25
			Statistical Analysis	IS	15
		DSE(A)-5-2-P	Applications of computers in chemistry	AS	45
		Total number of hours for DSE(A)-5-2 (Theory+Practical)			60T + 45P
		DSE(B)-5-1-TH INORGANIC MATERIALS OF INDUSTRIAL IMPORTANCE	Silicate Industries	SB	16
			Fertilizers	SB	8
			Surface Coatings	SG	10
			Batteries	SB	6
			Alloys	SG	10
			Catalysis	SG	6
			Chemical explosives	SG	4
		DSE(B)-5-1-P	1 . Determination of free acidity in ammonium sulphate fertilizer. 2. Estimation of phosphoric acid in superphosphate fertilizer. 3. Determination of composition of dolomite (by complexometric titration). 4. Analysis of (Cu, Ni); (Cu, Zn) in alloy or synthetic samples. 5. Analysis of Cement.	SB	45
		Total number of hours for DSE(B)-5-1 (Theory+Practical)			60T + 45P
	GEN	DSE(A)-5-2-TH INORGANIC MATERIALS OF INDUSTRIAL IMPORTANCE	Silicate Industries	SB	16
			Fertilizers	SB	8
			Surface Coatings	SG	10
			Batteries	SB	6
			Alloys	SG	10
			Catalysis	SG	6
			Chemical explosives	SG	4
		DSE(A)-5-2-P	1 . Determination of free acidity in ammonium sulphate fertilizer. 2. Estimation of phosphoric acid in superphosphate fertilizer.	SG+MK	45

			3. Determination of composition of dolomite (by complexometric titration). 4. Analysis of (Cu, Ni); (Cu, Zn) in alloy or synthetic samples. 5. Analysis of Cement.		
		Total number of hours for DSE(A)-5-2 (Theory+Practical)			60T + 45P
		SEC(A)-5-2-TH ANALYTICAL CLINICAL BIOCHEMISTRY	Carbohydrates, Proteins, Enzymes	AS	10
			Lipids, Lipoproteins	PR	10
			Biochemistry of disease: A diagnostic approach by blood/ urine analysis	SG	10
		Total number of hours for SEC(A)-5-2-TH			30T
6	HONS	CC-6-13-TH INORGANIC CHEMISTRY-5	Theoretical Principles in Qualitative Analysis of cations	SB	5
			Theoretical Principles in Qualitative Analysis of anions	SG	5
			Bioinorganic Chemistry	SB	25
			Organometallic Chemistry	SG	25
		CC-6-13-P	Qualitative semimicro analysis of mixtures containing not more than three radicals.	SB	45
		Total number of hours for CC-6-13 (Theory+Practical)			60T + 45P
		CC-6-14-TH PHYSICAL CHEMISTRY-5	Molecular Spectroscopy	IS	25
			Photochemistry and Theory of reaction rate	IS	15
			Surface phenomenon	IS	15
			Dipole moment and polarizability	Is	5
		CC-6-14-P	1. Determination of surface tension of a liquid using Stalagmometer 2. Determination of the indicator constant of an acid base indicator spectrophotometrically 3. Verification of Beer and Lambert's Law for $KMnO_4$ and $K_2Cr_2O_7$ solution 4. Study of kinetics of $K_2S_2O_8$+ KI reaction, spectrophotometrically 5. Determination of pH of unknown buffer, spectrophotometrically 6. Determination of CMC of a micelle from Surface Tension Measurement.	AS	45
		Total number of hours for CC-6-14 (Theory+Practical)			60T + 45P
		DSE(A)-6-3-TH	Introduction to Green Chemistry	PR	4

		GREEN CHEMISTRY AND CHEMISTRY OF NATURAL PRODUCT S	Principles of Green Chemistry and Designing a Chemical synthesis	PR	16
			Examples of Green Synthesis/ Reactions and some real world cases	PR	20
			Future Trends in Green Chemistry	PR	12
			Alkaloids	PR	5
			Terpenes	PR	3
		DSE(A)-6-3-P	Some green synthesis	PR	45
		Total number of hours for DSE(A)-6-3 (Theory+Practical)			60T + 45P
		DSE(B)-6-4-TH DISSERTATION	1.	AS	105
			2.		
			3.	IS	105
			4.		
			5. A brief overview on energy profile diagram of metal carbonyl catalysts	SG	105
			6. An overview on Schiff bases and its complexes: Synthesis, types and biological applications		
		Total number of hours for DSE(B)-6-4 (DISSERTATION)			105
	GEN	DSE(B)-6-1-TH GREEN CHEMISTRY AND CHEMISTRY OF NATURAL PRODUCT	Introduction to Green Chemistry	PR	4
			Principles of Green Chemistry and Designing a Chemical synthesis	PR	16
			Examples of Green Synthesis/ Reactions and some real world cases	PR	20
			Future Trends in Green Chemistry	PR	12
			Alkaloids	PR	5
			Terpenes	PR	3
		DSE(B)-6-1-P	Some green synthesis	PR+MK	45
		Total number of hours for DSE(B)-6-1 (Theory+Practical)			60T + 45P
		SEC(B)-6-4-TH PESTICIDE CHEMISTRY	General introduction to pesticides (natural and synthetic), benefits and adverse effects, changing concepts of pesticides,	SG	15
			structure activity relationship synthesis and technical manufacture and uses of representative pesticides	IS	15
		Total number of hours for SEC(B)-6-4-TH			30T

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