University of Calcutta under Graduate Curriculum under Choice Based Credit System (CBCS)
Lesson Plan with Syllabus for Chemistry (G) Semester-V
SEC-A-2 (Analytical Clinical Biochemistry)
Total Marks-100 (Credits: 2)
(Theory: 80; Internal Assessment: 10; Attendance: 10)
[Marks obtained in this course will be taken to calculate SGPA & CGPA]

Tentative, may subject to change: Theory Class					
Months	**Week**	**Unit**	**Topic**	**No. of Lectures**	**Teacher**
September (2021)	3rd	1	***Carbohydrates*** • Biological importance of carbohydrates, Metabolism, Cellular currency of energy (ATP)	2	PKD
	4th	1	***Carbohydrates*** • Glycolysis, Alcoholic and Lactic acid fermentations, Krebs cycle	2	PKD
	5th	1	***Carbohydrates*** • Isolation and characterization of polysaccharides	2	PKD
October	1st	2	***Proteins*** • Classification, biological importance	2	PKD
	2nd	2	***Proteins*** • Primary and secondary and tertiary structures of proteins: α-helix and β- pleated sheets, Isolation, characterization, denaturation of proteins	2	PKD
			11/10 – 30/10 Puja Vacation		
November	1st	3	***Enzymes*** ▪ Nomenclature, Characteristics (mention of Ribozymes), and Classification; Active site • Mechanism of enzyme action, Stereo specificity of enzymes, Coenzymes and cofactors	2	PKD
	2nd	3	***Enzymes*** • Enzyme inhibitors, Introduction to Bio-catalysis: Importance in "Green Chemistry" and Chemical Industry	2	PKD
	3rd	4	***Lipids*** • Classification. Biological importance of triglycerides and phosphoglycerides and cholesterol	2	PKD
	4th	4	***Lipids*** • Lipid membrane, Liposomes and their biological functions and underlying applications	2	PKD
December	1st	5	***Lipoproteins*** • Properties, functions and biochemical functions of steroid hormones. Biochemistry of peptide hormones	2	PKD
	2nd	5	***Lipoproteins*** • Structure of DNA (Watson-Crick model) and RNA, Genetic Code, Biological roles of DNA	2	PKD
	3rd	5	***Lipoproteins*** • RNA: Replication, Transcription and Translation, Introduction to Gene therapy	2	PKD
	4th	6	***Biochemistry of disease: A diagnostic approach by blood/ urine analysis***	2	PKD

			• *Blood:* Composition and functions of blood, blood coagulation. Blood collection and preservation of samples		
			Christmas Holiday		

Months	**Week**	**Unit**	**Topic**	**No. of Lectures**	**Teacher**
January	1st	6	• *Blood:* Anemia, Regulation, estimation and interpretation of data for blood sugar	2	PKD
	2nd	6	• *Blood:* urea, creatinine, cholesterol and bilirubin	2	PKD
	3rd		*Class for slow learners*	2	PKD
	4th	6	• *Urine:* Collection and preservation of samples. Formation of urine. Composition and estimation of constituents of normal and pathological urine	2	PKD
	4th		*****Guest Lecture***		
February (2022)	1st		• Class for advance learners • Question answers discussion	1	PKD
			▪ Homework assignment ▪ Question answers discussion	1	PKD
	2nd	**Internal Assessment**	**McQ based Internal Assessment for all sections**		PKD, SM, TKL

University of Calcutta under Graduate Curriculum under Choice Based Credit System (CBCS)
Lesson Plan with Syllabus for Chemistry (G) Semester-V
DSE-A-2 (Inorganic Materials for Industrial Importance)
Total Marks-100 (Credits: Theory-04, Practical-02)
(Theory: 50; Practical: 30; Internal Assessment: 10; Attendance: 10)
[Marks obtained in this course will be taken to calculate SGPA & CGPA]

Tentative, may subject to change: Theory Class					
Months	**Week**	**Unit**	**Topic**	**No. of Lectures**	**Teacher**
September (2021)	3rd	1	***Silicate Industries*** • *Glass:* Glassy state and its properties, classification (silicate and non-silicate glasses). Manufacture and processing of glass	1	SM
		3	***Surface Coatings***	1	TKL

			• Objectives of coatings surfaces, preliminary treatment of surface, classification of surface coatings		
	4th	1	***Silicate Industries*** • *Glass:* Composition and properties of the following Types of glasses: Soda lime glass, lead glass	1	SM
		3	***Surface Coatings*** • Paints and pigments-formulation, composition and related properties. Oil paint, Vehicle, modified oils	1	TKL
	5th	1	***Silicate Industries*** • *Glass:* armoured glass, safety glass, borosilicate glass	1	SM
		3	***Surface Coatings*** • Pigments, toners and lakes pigments, Fillers, Thinners, Enamels, emulsifying agents	1	TKL
October	1st	1	***Silicate Industries*** *Glass:* fluorosilicate, coloured glass, photosensitive glass	1	SM
		3	***Surface Coatings*** • Special paints (Heat retardant, Fire retardant, Eco-friendly paint, Plastic paint), Dyes, Wax polishing	1	TKL
	2nd	2	***Silicate Industries*** • *Ceramics:* Important clays and feldspar, ceramic, their types and manufacture	1	SM
		3	***Surface Coatings*** • Water and Oil paints, additives, Metallic coatings (electrolytic and electro less), metal spraying and anodizing	1	TKL
			11/10 – 30/10 Puja Vacation		
November	1st	1	***Silicate Industries*** • *Ceramics:* High technology ceramics and their applications	1	SM
		5	***Alloys*** • Classification of alloys, ferrous and non-ferrous alloys, Specific properties of elements in alloys	1	TKL
	2nd	1	***Silicate Industries*** • *Ceramics:* Superconducting and semiconducting oxides, fullerenes carbon nanotubes and carbon fibre	1	SM
		5	***Alloys*** • Manufacture of Steel (removal of silicon decarbonization, demagnetization, desulphurization dephosphorisation)	1	TKL
	3rd	1	***Silicate Industries*** • *Ceramics:* Superconducting and semiconducting oxides, fullerenes carbon nanotubes and carbon fibre	1	SM
		5	***Alloys*** • Surface treatment (Arand heat treatment, nitriding, carburizing) • Composition and properties of different types of steels	1	TKL

	4th	1	***Silicate Industries*** • *Cements:* Classification of cement, ingredients and their role	1	SM
		6	***Catalysis*** • General principles and properties of catalysts	1	TKL
December	1st	1	***Silicate Industries*** • *Cements:* Manufacture of cement and the setting process, quick setting cements	1	SM
		6	***Catalysis*** • Homogenous catalysis (catalytic steps and examples)	1	TKL
	2nd	2	***Fertilizers*** • Different types of fertilizers	1	SM
		6	***Catalysis*** • Heterogeneous catalysis (catalytic steps and examples) and their industrial applications	1	TKL
	3rd	2	***Fertilizers*** • Manufacture of the following fertilizers: Urea, ammonium nitrate, calcium ammonium nitrate	1	SM
		6	***Catalysis*** • Phase transfer catalysts, application of zeolites as catalysts	1	TKL
	4th	2	***Fertilizers*** • Manufacture of the following fertilizers: ammonium phosphates; polyphosphate, superphosphate, compound and mixed fertilizers, potassium chloride, potassium sulphate	1	SM
		7	***Chemical explosives*** • Origin of explosive properties in organic compounds	1	TKL
			Christmas Holiday		

Months	**Week**	**Unit**	**Topic**	**No. of Lectures**	**Teacher**
January	1st	4	***Batteries*** • Primary and secondary batteries, battery components and their role	1	SM
		7	***Chemical explosives*** • Preparation and explosive properties of lead azide	1	TKL
	2nd	4	***Batteries*** • Characteristics of Battery	1	SM
		7	***Chemical explosives*** • PETN, cyclonite (RDX)	1	TKL
	3rd	4	***Batteries*** • Working of following batteries: Pb acid, Li-Battery, Solid state electrolyte battery	1	SM
			Class for slow learners	1	TKL

	4th		*Class for slow learners*	1	SM
		7	***Chemical explosives*** • Introduction to rocket propellants	1	TKL
	4th		*****Guest Lecture***		
February (2022)	1st		• Class for advance learners • Question answers discussion	1	SM
			▪ Class for advance learners ▪ Homework assignment ▪ Question answers discussion	1	TKL
	2nd	**Internal Assessment**	**McQ based Internal Assessment for all sections**		PKD, SM, TKL

Tentative may subject to change: Practical Class

Months	Weeks	Topic	Teacher
September	3rd	▪ Laboratory work discussion	PKD
	4th to 5th	• Determination of free acidity in ammonium sulphate fertilizer	
October	1st to 2nd	• Determination of composition of dolomite (by complexometric titration)	
November	1st to 2nd	• Analysis of (Cu, Ni); (Cu, Zn) in alloy or synthetic samples	
	3rd to 4th	• Analysis of Cement	
December	1st to 2nd	▪ Electroless metallic coatings on ceramic and plastic material	
	3rd to 4th	• Estimation of phosphoric acid in superphosphate fertilizer	
January	1st to 2nd	• Estimation of Calcium in Calcium ammonium nitrate fertilizer	
	3rd	• Preparation of pigment (zinc oxide)	
	4th	• Repeat of experiments	