Syllabus Module

Department of Chemistry
Khatra Adibasi Mahavidyalaya

Session 2021-2022

Faculty Name	1st Semester	3rd Semester	5th Semester
Dr. Swarup Kumar Maji	**Core C1A - T1 Inorganic Chemistry** Atomic Structure Chemical Periodicity Acids and bases Redox reactions **Core C1A - P1 Inorganic Chemistry Lab** **Total Lectures (C1A): 40**	**Core C6 - T6 - Inorganic Chemistry II** Chemical Bonding-I Chemical Bonding-II Radioactivity **Core C6 - P6 - Inorganic Chemistry II Lab** Iodo / Iodimetric Titrations Estimation of metal content in some selective samples **Total Lectures (C6): 80**	**Core C11 - T11 - Inorganic Chemistry IV** Coordination Chemistry-II **Core C11 - P11 - Inorganic Chemistry IV Lab** Gravimetry **Total Lectures (C11): 60**
Dr. Ramakanta Mondal	**Core C2 - T2 - Physical Chemistry I** Kinetic Theory and Gaseous state Chemical Thermodynamics Chemical kinetics **Core C2 - P2 - Physical Chemistry I Lab** **Total Lectures (C2): 80**	**Core C5 - T5 - Physical Chemistry II** Transport processes Applications of Thermodynamics – I Foundation of Quantum Mechanics **Core C1C – T3 Physical Chemistry** Chemical Energetics Chemical Equilibrium Conductance **Core C5 - P5 - Physical Chemistry II Lab** **Core C1C – P3 Physical Chemistry Lab** Thermochemistry Conductance **Total Lectures (C1C): 40** **Total Lectures (C5): 80**	**DSE1 - T1 – Advanced Physical Chemistry** Crystal Structure Statistical Thermodynamics Special selected topics **SEC3 - T3 - IT Skills for Chemists** Mathematics Computer programming Hands On Practical **DSE1 - P1 – Advanced Physical Chemistry Lab** Computer Programming based on numerical methods **Total Lectures (SEC3): 40** **Total Lectures (DSE1): 80**

Sri Soumen Rakshit		**SEC T1 – Basic Analytical Chemistry** Introduction Analysis of soil Analysis of water Analysis of food products Chromatography Ion-exchange Analysis of cosmetics Suggested Applications Suggested Instrumental demonstrations **Total Lectures (SEC1): 40**	**Core C11 - T11 - Inorganic Chemistry IV** Chemistry of d- and f- block elementsTransition Elements Lanthanoids and Actinoids **DSE2 - T2 - Green Chemistry** Introduction to Green Chemistry Principles of Green Chemistry and Designing a Chemical synthesis Examples of Green Synthesis/ Reactions and some real world cases Future Trends in Green Chemistry **Core C11 - P11 - Inorganic Chemistry IV Lab** Chromatography of metal ions **DSE2 - P2 - Green Chemistry Lab** Safer starting materials Using renewable resources Avoiding waste Use of enzymes as catalysts Alternative Green solvents Alternative sources of energy **Total Lectures (C11): 20** **Total Lectures (DSE2): 80**
Sri Saroj Modak	**Core C1 - T1 Organic Chemistry I** Bonding and Physical Properties General Treatment of Reaction Mechanism I Stereochemistry-I **Core C1A - T1 Organic Chemistry** Fundamentals of Organic Chemistry Stereochemistry Nucleophilic Substitution and Elimination Reactions Aliphatic Hydrocarbons Alkanes Alkenes Alkynes Reactions	**Core C7 - T7 - Organic Chemistry III** Chemistry of alkenes and alkynes Aromatic Substitution Carbonyl and Related Compounds Organometallics **Core C1C – T3 Organic Chemistry II** Aromatic Hydrocarbons Organometallic Compounds Aryl Halides Alcohols, Phenols and Ethers Carbonyl Compounds **Core C7 - P7 - Organic Chemistry III Lab**	**Core C12 - T12 - Organic Chemistry V** Carbocycles and Heterocycles Cyclic Stereochemistry Pericyclic reactions Carbohydrates Biomolecules **Core C12 - P12 - Organic Chemistry V Lab** Chromatographic Separations Spectroscopic Analysis of Organic Compounds **Total Lectures (C12): 80**

	Core C1 - P1 – Organic Chemistry I Lab Separation Determination of boiling point Identification of a Pure Organic Compound **Core C1A - P1 Organic Chemistry Lab** Qualitative Analysis of Single Solid Organic Compound(s) **Total Lectures (C1A): 40** **Total Lectures (C1): 80**	Qualitative Analysis of Single Solid Organic Compounds **Core C1C – P3 Organic Chemistry Lab** Identification of a pure organic compound **Total Lectures (C1C): 40** **Total Lectures (C7): 80**	
Tentative date of internal assessment: 2nd week of January 2022			

	2nd Semester	**4th Semester**	**6th Semester**
Dr. Swarup Kumar Maji	**Core C3 - T3 - Inorganic Chemistry II** Extra nuclear Structure of atom Chemical periodicity **Core C1B – T2 Inorganic Chemistry** Chemical Bonding and Molecular Structure Comparative study of p-block elements **Core C3 - P3 - Inorganic Chemistry II Lab** Acid and Base Titrations **Core C1B – P2 Inorganic Chemistry Lab** Qualitative semi-micro analysis of mixtures containing three radicals **Total Lectures (C3): 50** **Total Lectures (C1B): 40**	**Core C9 - T9 - Inorganic Chemistry III** General Principles of Metallurgy Chemistry of s and p Block Elements Inorganic Polymers **Core C1D – T4 Inorganic Chemistry** Transition Elements Coordination Chemistry Crystal Field Theory Analytical and Industrial Chemistry **Core C9 - P9 - Inorganic Chemistry III Lab** Inorganic preparations **Core C1D – P4 Inorganic Chemistry Lab** **Total Lectures (C9): 50** **Total Lectures (C1D): 40**	**Core C13 - T13 - Inorganic Chemistry V** Bioinorganic Chemistry Organometallic Chemistry Catalysis by Organometallic Compounds Reaction Kinetics and Mechanism **Core C13 - P13 - Inorganic Chemistry V Lab** Qualitative semimicro analysis **Total Lectures (C13): 80**
	Core C1B – T2 Physical Chemistry Kinetic Theory of Gases and Real gases Liquids Solids Chemical Kinetics **Core C1B – P2 Physical Chemistry Lab** Surface tension measurement	**Core C8 - T8 - Physical Chemistry III** Application of Thermodynamics – II Electrical Properties of molecules Quantum Chemistry **Core C8 - P8 - Physical Chemistry III Lab** **Total Lectures (C8): 80**	**Core C14 - T14 - Physical Chemistry IV** Molecular Spectroscopy Photochemistry Surface phenomenon **DSE4 - T4 – Polymer Chemistry** Introduction and history of polymeric materials Functionality and its importance

Dr. Ramakanta Mondal	Viscosity measurement Kinetics Study **Total Lectures (C1B): 40**		Kinetics of Polymerization Crystallization and crystallinity Nature and structure of polymers Determination of molecular weight of polymers Glass transition temperature (Tg) and determination of Tg Polymer Solution Properties of Polymer **Core C14 - P14 - Physical Chemistry IV Lab** **DSE4 - P4 – Polymer Chemistry Lab** Polymer Synthesis Polymer characterization Polymer analysis **Total Lectures (C14): 80** **Total Lectures (DSE4): 80**
Sri Soumen Rakshit	**Core C3 - T3 - Inorganic Chemistry II** Acid-Base reactions Redox Reactions and precipitation reactions **Core C3 - P3 - Inorganic Chemistry II Lab** Oxidation-Reduction Titrations **Total Lectures (C3): 30**	**Core C9 - T9 - Inorganic Chemistry III** Noble Gases Coordination Chemistry-I **Core C9 - P9 - Inorganic Chemistry III Lab** Complexometric titration **Total Lectures (C9): 30**	**DSE3 - T3 – Analytical Methods in Chemistry** Qualitative and quantitative aspects of analysis Optical methods of analysis Thermal methods of analysis Electroanalytical methods Separation techniques **DSE3 - P3 – Analytical Methods in Chemistry Lab** Separation Techniques – Chromatography Solvent Extractions Spectrophotometry **Total Lectures (DSE3): 80**
Sri Saroj Modak	**Core C4 - T4 - Organic Chemistry II** Stereochemistry II General Treatment of Reaction Mechanism II Substitution and Elimination Reactions **Core C4 - P4 - Organic Chemistry II Lab** Organic Preparations **Total Lectures (C4): 80**	**Core C10 - T10 - Organic Chemistry IV** Nitrogen compounds Rearrangements The Logic of Organic Synthesis Organic Spectroscopy **SEC2 - T2 - Pharmaceuticals Chemistry** Drugs & Pharmaceuticals Fermentation Hands On Practical **Core C1D – T4 Organic Chemistry**	**SEC4 - T4 – Analytical Clinical Biochemistry** Carbohydrates Proteins Enzymes Lipids Structure of DNA (Watson-Crick model) and RNA Biochemistry of disease Hands On Practical **Total Lectures (SEC4): 40**

		Carboxylic Acids and Their Derivatives Amines and Diazonium Salts Amino Acids and Carbohydrates **Core C10 - P10 - Organic Chemistry IV Lab** **Core C1D – P4 Organic Chemistry Lab** **Total Lectures (C10): 80** **Total Lectures (C1D): 40** **Total Lectures (SEC2): 40**	
Tentative date of internal assessment: 2nd week of May 2022			