



Syllabus Module

Department of Chemistry
Khatra Adibasi Mahavidyalaya

Session 2022-2023

<u>Faculty Name</u>	<u>1st Semester</u>	<u>3rd Semester</u>	<u>5th Semester</u>
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

<p>Sri Soumen Rakshit</p>		<p>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</p> <p>Total Lectures (SEC1): 40</p>	<p>Core C11 - T11 - Inorganic Chemistry IV Chemistry of d- and f- block elements Transition Elements Lanthanoids and Actinoids</p> <p>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</p> <p>Core C11 - P11 - Inorganic Chemistry IV Lab Chromatography of metal ions</p> <p>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</p> <p>Total Lectures (C11): 20 Total Lectures (DSE2): 80</p>
<p>Sri Saroj Modak</p>	<p>Core C1 - T1 Organic Chemistry I Bonding and Physical Properties General Treatment of Reaction Mechanism I Stereochemistry-I</p> <p>Core C1A - T1 Organic Chemistry Fundamentals of Organic Chemistry Stereochemistry Nucleophilic Substitution and Elimination Reactions Aliphatic Hydrocarbons Alkanes Alkenes Alkynes Reactions</p>	<p>Core C7 - T7 - Organic Chemistry III Chemistry of alkenes and alkynes Aromatic Substitution Carbonyl and Related Compounds Organometallics</p> <p>Core C1C – T3 Organic Chemistry II Aromatic Hydrocarbons Organometallic Compounds Aryl Halides Alcohols, Phenols and Ethers Carbonyl Compounds</p>	<p>Core C12 - T12 - Organic Chemistry V Carbocycles and Heterocycles Cyclic Stereochemistry Pericyclic reactions Carbohydrates Biomolecules</p> <p>Core C12 - P12 - Organic Chemistry V Lab Chromatographic Separations Spectroscopic Analysis of Organic Compounds</p> <p>Total Lectures (C12): 80</p>

	<p>Core C1 - P1 – Organic Chemistry I Lab Separation Determination of boiling point Identification of a Pure Organic Compound</p> <p>Core C1A - P1 Organic Chemistry Lab Qualitative Analysis of Single Solid Organic Compound(s) Total Lectures (C1A): 40 Total Lectures (C1): 80</p>	<p>Core C7 - P7 - Organic Chemistry III Lab Qualitative Analysis of Single Solid Organic Compounds</p> <p>Core C1C – P3 Organic Chemistry Lab Identification of a pure organic compound Total Lectures (C1C): 40 Total Lectures (C7): 80</p>	
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Tentative date of internal assessment: Mid of November 2022

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

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

		<p>Core C1D – T4 Organic Chemistry Carboxylic Acids and Their Derivatives Amines and Diazonium Salts Amino Acids and Carbohydrates</p> <p>Core C10 - P10 - Organic Chemistry IV Lab</p> <p>Core C1D – P4 Organic Chemistry Lab Total Lectures (C10): 80 Total Lectures (C1D): 40 Total Lectures (SEC2): 40</p>	
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