Rishi Bankim Chandra Evening College

(Founded: 1947 • University Affiliation after Trifurcation: 1984)

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Ref. No. …… **Date: ……**

COURSE OUTCOME OF CHEMISTRY FOR 3-YEAR MULTIDISIPLINARY UG PROGRAMME (NEP)

Paper code and unit	COURSE OUTCOME
SEM 1 **CEMMIN101T/CEMGCOR101T**	
Unit 1 **Inorganic**	On successful completion, students would have clear understanding of the concepts related to atomic structure, chemical bonding, periodic properties of s, p, d, f block element. Student also understand the concept of acid and bases and applications.
Unit 2 **Organic**	Students will learn the fundamental concepts of organic chemistry and gain a deep knowledge about aliphatic hydrocarbons, preparations and reactions.
Unit 3 **Physical**	In gaseous state, the students will learn the concept of kinetic theory, ideal gas and real gases. In liquids, the students are expected to learn the qualitative treatment of the structure of liquid along with the physical properties of liquid, viz, surface tension and viscosity.
CEMMIN101P/CEMGCOR101P2	In Practical classes, students will understand theories better by observing them in action. Students will practise the preparation of standard solution in different concentration for analysing some oxidising and reducing substance by titration to clear their concept of redox reactions. Students will be able to identify different classes of organic compounds by performing hands on experiments. Chemical reactions in theory will be more interesting by preparing some organic compounds in lab. Instrument handling skill

	will increase by performing physical experiment on surface tension and viscosity.
SEM 2 **CEMMIN202T/CEMGCOR202T**	
Unit 1 **Inorganic**	On successful completion, students would gain clear understanding of the concepts related to chemical bonding, molecular structure. In theory, students will learn about molecular shapes, isomerism, and chirality of various organic and inorganic compounds. They will study redox reactions deeply.
Unit 2 **Organic**	In this unit, by studying stereochemistry, students are expected to learn how slight changes in spatial arrangement can lead to very different properties and will develop spatial and visual thinking skill. They will also learn the mechanistic approach of a substitution and elimination reactions.
Unit 3 **Physical**	The students are expected to learn laws of thermodynamics, thermodynamic functions, thermochemistry, principles of heat engines etc. in this unit.
CEMMIN202P/CEMGCOR202P	On successful completion of this course students would be able to apply theoretical principles of redox chemistry in real life problems and bridges the gap between theory and application. Students will be able to describe and classify organic compounds in terms of their functional groups. Estimation skill will enhance by experimental determination of solubility product.
SEM 3 **CEMMIN303T/CEMGCOR303T**	
Unit 1 **Inorganic**	The students are expected to understand the nature of radioactive decay and application of radioactive laws in calculation of half-life, decay constant, radio carbon dating. Student can predict molecular electronic configurations using MO diagrams for diatomic molecules (e.g., O_2, N_2, F_2) of first and second period.
Unit 2 **Organic**	By the end of this unit, students will be able to understand the structure, classification, reaction, preparation procedure and differentiation of different alcohols, ethers and carbonyl compounds.
Unit 3 **Physical**	Students will be able to understand the fundamental concepts of reaction rate, factors affecting the reaction

	rate, the temperature dependence of reaction rates using collision theory and transition state theory, and to interpret rate laws from experimental data.
CEMMIN303P/CEMGCOR303P	Practical coure will connect theories to real-world applications. Students will get hand on training for estimation of compounds by utilising suitable chemical reactions. Heat of neutralisation will be calculated in laboratory. Skills for the estimation of compounds will be developed by analyzing experimental data, applying appropriate chemical methods, and interpreting quantitative results through titrations, gravimetric analysis, or instrumental techniques
SEM 4 **CEMGCOR404T**	
Unit 1 **Inorganic**	By the end of this unit, learners will be able to compare and analyse the electronic configurations and periodic trends (atomic size, ionization enthalpy, electronegativity, oxidation states) of p-block elements across groups 13 to 18 and evaluate the structural and bonding features of anomalous compounds of this block.
Unit 2 **Organic**	In this unit, learner will gain the profound knowledge about mechanistic approach of hydrolysis reaction and reactions of nitro compounds, amines, alkylnitrile and isonitriles. Students will also learn about important reagents and reactions of industrial importance.
Unit 3 **Physical**	By the end of the course, the learner will be able to analyze the effect of changing conditions (concentration, pressure, temperature, volume, and catalysts) on the position of equilibrium using Le Chatelier's Principle, interpret the relationship between Gibbs free energy and equilibrium constant to predict the spontaneity and feasibility of reactions. Students will also learn the concept of ionic equilibrium in aqueous solutions and distinguish it from chemical equilibrium and will be able to assess pH, buffer action, buffer capacity, solubility product, common ion effect and practical applications of ionic equilibria.
CEMGCOR404P	In this practical course, students will learn chromatography, an important industrial tool to separate mixture to the individual components. Preparative skill will be enhanced by acetanilide, buffer solution preparation. Students will also learn

	complexometric titration and calculation of hardness of water.
SEM 5 **CEMGCOR505T**	
Unit 1 **Inorganic**	Students will be able to explain the basic concepts and terminology of coordination compounds, IUPAC nomenclature, stereoisomerism of complexes, Werner's theory, and crystal field theory (CFT) to explain the bonding, geometry, magnetic properties, and color of coordination compounds.
Unit 2 **Organic**	In this unit, students will learn important named reactions for preparation of heterocyclic compounds. They also gain knowledge about organometallic compounds and uses of organometalics in preparation of various organic compounds.
Unit 3 **Physical**	At the end of the course, students will gain practical understanding of electrochemistry and solution behaviour, problem-solving with real and theoretical conductivity data an application of conductance in environmental and industrial contexts.
CEMGCOR505P	In this practical course, students will learn an industrial and laboratory technique of separation, thin layer chromatography for separation of amino acids. Estimation of metal ions, conductometric titration, pH metric titration will also be taught in this course and Students will develop a deeper and more comprehensive understanding of theoretical concepts through hands-on practical experiments.
SEM 6 **CEMGCOR606T**	
Unit 1 **Inorganic**	By the end of this course, the learner will be able to explain the role of metal ions in biological systems, including their structural, catalytic, and regulatory functions. The structure and function of metalloproteins and metalloenzymes, such as haemoglobin, myoglobin, cytochromes etc. will be taught to enhance analytical thinking in biochemical pathways. The use of metal complexes in medicine part will increase awareness of health and environmental aspects of metal ions
Unit 2 **Organic**	After the completion of this unit, student will earn knowledge about the structure, reactivity, and functions of biomolecules, including carbohydrates, amino acids, peptides, proteins, nucleic acids, and

	lipids. They will also learn industrial synthesis protocol of some important drugs.
Unit 3 **Physical**	After this course, students will be able to understand the polymer classification and explain the mechanisms of polymerization reactions, such as addition (chain-growth), condensation (step-growth), copolymerization, and ring-opening polymerization. Students will learn about polymer synthesis and applications, the structure-property relationships in polymers and analysing the techniques for polymer characterization.
CEMGCOR606P	In the practical course, students will learn the qualitative analysis of inorganic samples, cations and anions. Skill for separation of organic compounds will also develop. Students will also synthesize nylon 66 and urea-formaldehyde resin in lab.