GOVERNMENT DEGREE COLLEGE,

RAYACHOTY, ANNAMAYYA DISTRICT, A.P.516269

(Accredited with C grade by NAAC)

Department of Chemistry

COURSE OUTCOMES

B.Sc. CHEMISTRY

UNDER CBCS FRAMEWORK

WITH EFFECT FROM 2015-16

Title of the Course: Inorganic and organic chemistry Students after successful completion of the course will be able to:	
CO-1	Understand the basic concepts of p-block elements
CO-2	Understand The Concept of Lattice Energy.
CO-3	Learn Band Theory and It's Applications in rationalizing the Conductivity of Metals, Semi Conductors and Insulators
CO-4	Understand and explain the differential behavior oforganic compounds based on fundamental conceptslearnt.
CO-5	Formulate the mechanism of organic reactions by recalling and correlating the fundamental properties of the reactants involved.

Title of the Course: Physical and General Chemistry Students after successful completion of the course will be able to:	
CO-1	Explain the difference between solid, liquid and gases interms of inter molecular interactions.
CO-2	Apply the concepts of gas equations, pH and electrolytes while studying otherchemistry courses.
CO-3	Learn and identify many organic reaction mechanisms including Free Radical Substitution, Electrophilic Addition and Electrophilic Aromatic Substitution.
CO-4	Correlate and describe the stereochemical properties of organiccompounds and reactions

Title of the Course: Inorganic and organic chemistry Students after successful completion of the course will be able to:	
CO-1	Gain knowledge of the chemistry of transition metals, including their electronic configurations, oxidation states, and complex formation.
CO-2	Learn about the structure, bonding, and reactivity of organometallic compounds.
CO-3	Understand the chemistry of lanthanides and actinides, including their separation, electronic structure, and typical reactions.
CO-4	Understand the detailed mechanisms of organic reactions, including nucleophilic substitution, elimination, and addition reactions.
CO-5	Learn about the three-dimensional arrangement of atoms in molecules and the concepts of chirality, enantiomers, diastereomers, and optical activity.
CO-6	Understand the structure, properties, and reactions of aromatic compounds, including electrophilic aromatic substitution.

Title of the Course: Spectroscopy and Physical Chemistry Students after successful completion of the course will be able to:	
CO-1	understand the basic principles of spectroscopy, including absorption, emission, and scattering of electromagnetic radiation.
CO-2	Gain knowledge of various types of spectroscopy, such as UV-Vis, IR, NMR, Raman, and Mass Spectrometry.
CO-3	Understand the design and function of spectroscopic instruments.
CO-4	Understand the laws of thermodynamics and their applications to chemical systems.
CO-5	Comprehend the principles of chemical kinetics, including reaction rates and mechanisms.
CO-6	Understand the principles of quantum mechanics and their application to chemical systems.

Title of the Course: Inorganic, Organic and Physical Chemistry Students after successful completion of the course will be able to:	
CO-1	The students will gain an understand how to classify of coordination compounds.
CO-2	Describe the electronic selection rules and correlate the intensity and wavelength of Coordination geometry
CO-3	Students will be provided with an introduction to the fundamentals of electrochemistry and solution properties. And understand how simple ions added to aqueous solution affect the structure of water.
CO-4	The students Understand why a solution conducts electricity and how it can be measured.and the relationship between the cell potential, and also how to measure a standard electrode potential using a standard reference electrode
CO-5	Defines the importance of phase diagrams in the field of material science. And define the importance of basic definitions Phase,Equilibrium,Component,Degree of freedom and phase rule concept

Title of the Course: Inorganic, Organic and Physical Chemistry Students after successful completion of the course will be able to:	
CO-1	The students will gain an understand how to classify of coordination compounds,Valencebond theory,Hybridisation.
CO-2	Describe the electronic selction rules and correlate the intensity and wavelength of Coordinationgeometry.
CO-3	The students will gain an understand the classification and nomenclature &named reactions of nitro hydrocarbons
CO-4	They know the nomenclature,classification of primary,secondry,tertiary &quaternary amines and its synthesis and applications of nitrogen compounds.
CO-5	Students will gain an understanding of the first law of Thermodynamics and how to express its mathematical application and calculate energy

Title of the Course: Environmental Chemistry Students after successful completion of the course will be able to:	
CO-1	Understand the environment functions and how it is affected by human activities
CO-2	Acquire chemical knowledge to ensure sustainable use of the world's resources and ecosystems services.
CO-3	Engage in simple and advanced analytical tools used to measure the different types of pollution.
CO-4	Explain the energy crisis and different aspects of sustainability.
CO-5	Analyze key ethical challenges concerning biodiversity and understand the moral principles, goals and virtues important for guiding decisions that affect Earth's plant and animal life

Title of the Course: Fuel Chemistry and Batteries Students after successful completion of the course will be able to:	
CO-1	Understand the different types of fuels, including fossil fuels, biofuels, and synthetic fuels.
CO-2	Comprehend the chemical processes involved in the combustion of fuels and the formation of pollutants.
CO-3	Understand the environmental impact of fuel use and the measures for pollution control and mitigation.
CO-4	Understand the fundamental principles of batteries, including electrochemical reactions, voltage, and capacity.
CO-5	Gain knowledge of different types of batteries, such as primary (non-rechargeable) and secondary (rechargeable) batteries.
CO-6	Learn about the chemical compositions and reactions of various battery types, including lead-acid, lithium-ion, nickel-metal hydride, and others.

Title of the Course: Inorganic Materials of Industrial Importance Students after successful completion of the course will be able to:	
CO-1	Understand the composition and application of different kinds of glass Also get learning about glazing of ceramics and the factors affecting their porosity. Develop an understanding about the manufacturing of cement and the mechanism of setting of cement.
CO-2	Understand the suitability of fertilizers for different kinds of crops and soil.
CO-3	Student will learn the process of formulation of paints and the basic principle behind the protection offered by the surface coatings
CO-4	Understand the principle, working and applications of different types of batteries.
CO-5	This topic lists and explains the properties of engineering materials for mechanical construction used in day to day life.

Title of the Course: Analysis of Applied Industrial Products Students after successful completion of the course will be able to:	
CO-1	Gain a comprehensive understanding of various industrial products, including their composition and applications.
CO-2	Learn various analytical techniques used to analyze industrial products, such as chromatography, spectroscopy, and mass spectrometry.
CO-3	Understand the chemical analysis of industrial products to determine their purity, composition, and chemical properties
CO-4	Understand the importance of sustainability in the production and analysis of industrial products, including the use of green chemistry principles.
CO-5	Develop hands-on laboratory skills in the analysis of industrial products, including sample preparation, instrument operation, and data analysis.

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GOVERNMENT DEGREE COLLEGE,

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Department of Chemistry

COURSE OUTCOMES

B.Sc. CHEMISTRY

UNDER REVISED CBCS FRAMEWORK

WITH EFFECT FROM 2020-21

Title of the Course: Inorganic and Physical Chemistry Students after successful completion of the course will be able to:	
CO-1	Understand the basic concepts of p-block elements
CO-2	To make student understand the modern periodic table which stand the back bone in understanding chemistry and the periodic properties
CO-3	Explain the difference between solid, liquid and gases interms of inter molecular interactions.
CO-4	Apply the concepts of gas equations, pH and electrolytes while studying otherchemistry courses.

Title of the Course: Organic and General Chemistry Students after successful completion of the course will be able to:	
CO-1	Understand and explain the differential behavior of organic compounds based on fundamental concepts learnt.
CO-2	Formulate the mechanism of organic reactions by recalling and correlating the fundamental properties of the reactants involved.
CO-3	Learn and identify many organic reaction mechanisms including Free Radical Substitution, Electrophilic Addition and Electrophilic Aromatic Substitution.
CO-4	Correlate and describe the stereochemical properties of organiccompounds and reactions

Title of the Course: Organic Chemistry and Spectroscopy Students after successful completion of the course will be able to:	
CO-1	The students will be an Understand the distinguish aliphatic and aromatic halogenated organic compounds and they know the preparation methods for the halogenated organic compounds.The students will Understand the interpret reactivity of aldehydes and ketones
CO-2	The students will write different preparation methods and properties for carboxylic acids and their derivatives
CO-3	The students will gain an understand the Spectroscopy and how to analyzed the unknown organic compounds by using instrumentation of spectrophotometers of IR spectroscopy Electronic spectroscopy and proton magnetic resonance spectroscopy
CO-4	The fundamentals of electronic structure and bonding in conjugated and aromatic systems by using Electronic spectroscopy

Title of the Course: Inorganic, Organic and Physical Chemistry Students after successful completion of the course will be able to:	
CO-1	To learn about the laws of absorption of light energy by molecules and thesubsequent photo chemical reactions.
CO-2	To understand the concept of quantum efficiency and mechanism of photochemicalreactions

Title of the Course: Inorganic and Physical Chemistry Students after successful completion of the course will be able to:	
CO-1	Understand concepts of boundary conditions and quantization, probability distribution,most probable values, uncertainty and expectation values
CO-2	Application of quantization to spectroscopy.
CO-3	Various types of spectra and their use in structure determination

Title of the Course: Environmental Chemistry Students after successful completion of the course will be able to:	
CO-1	Understand the environment functions and how it is affected by human activities
CO-2	Acquire chemical knowledge to ensure sustainable use of the world's resources and ecosystems services.
CO-3	Engage in simple and advanced analytical tools used to measure the different types of pollution.
CO-4	Explain the energy crisis and different aspects of sustainability.
CO-5	Analyze key ethical challenges concerning biodiversity and understand the moral principles, goals and virtues important for guiding decisions that affect Earth’s plant and animal life

Title of the Course: Green Chemistry and Nano Technology Students after successful completion of the course will be able to:	
CO-1	Understand the importance of Green Chemistry and Green synthesis.
CO-2	Engage in Microwave-assisted organic synthesis.
CO-3	Demonstrate skills using alternative green solvents in synthesis.
CO-4	Demonstrate and explain enzymatic catalysis.
CO-5	Analyze alternative sources of energy and carry out green synthesis.
CO-6	Carry out the chemical method of nanomaterial synthesis.

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Department of Chemistry

COURSE OUTCOMES

B.Sc. HONOURS CHEMISTRY (MINOR)

4-YEARS UG HONOURS PROGRAM WITH SINGLE MAJOR AND ONE MINOR

WITH EFFECT FROM 2023-24

Title of the Course: General and Inorganic Chemistry

Students after successful completion of the course will be able to:

CO-1	Understand the structure of atom and the arrangement of elements in the periodic table.
CO-2	Understand the nature and properties of ionic compounds.
CO-3	Identify the structure of a given inorganic compound.
CO-4	Explain the existence of special types of compounds through weak chemical force
CO-5	Define acids and bases and predict the nature of salts

Title of the Course: Fundamentals in Organic Chemistry

Students after successful completion of the course will be able to:

CO-1	Understand and explain the differential behavior of organic compounds based on fundamental concepts learned.
CO-2	Formulate the mechanism of organic reactions by recalling and correlating the fundamental properties of the reactants involved.
CO-3	Learn and identify many organic reaction mechanisms.
CO-4	Correlate and describe the stereo-chemical properties of organic compounds and reactions.

Title of the Course: Physical Chemistry-II Students after successful completion of the course will be able to:	
CO-1	Explain the difference between solids liquids and gases in terms of intermolecular interactions.
CO-2	Differentiate ideal and real gases.
CO-3	Discuss the basic concepts of two-component systems
CO-4	Apply the concepts of adsorption.
CO-5	Understand the basic concepts of crystallography

Title of the Course: General and Physical Chemistry Students after successful completion of the course will be able to:	
CO-1	Correlate and describe the stereochemical properties of organic compounds.
CO-2	Explain the biological significance of various elements present in the human body. .
CO-3	Apply the concepts of ionic equilibrium for the qualitative and quantitative analysis.
CO-4	Determine the order of a chemical reaction.
CO-5	Describe the basic concepts of enzyme catalysis

Title of the Course: Environmental Chemistry Students after successful completion of the course will be able to:	
CO-1	Understand the environment functions and how it is affected by human activities
CO-2	Acquire chemical knowledge to ensure sustainable use of the world's resources and ecosystems services.
CO-3	Engage in simple and advanced analytical tools used to measure the different types of pollution.
CO-4	Explain the energy crisis and different aspects of sustainability.
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CO-5	Analyze alternative sources of energy and carry out green synthesis.
CO-6	Carry out the chemical method of nanomaterial synthesis.

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