A. S.D.GOVT.DEGREE COLLEGE FOR WOMEN(A), KAKINADA
DEPARTMENT OF CHEMISTRY
2025-2026

COURSE OUTCOMES

Semester-1

COURSE 1: GENERAL CHEMISTRY
Course Code : CHE25101

On Completion of the course, the students will be able to-		Cognitive Domain
CO1	Describe the electronic configuration of elements and periodic trends.	Understanding
CO2	Analyze the formation and properties of ionic compounds and covalent compounds.	Analysis
CO3	Apply VSEPR, hybridization, and MOT to predict molecular geometry and bonding..	Application
CO4	Explain metallic bonding, hydrogen bonding, and intermolecular forces and relate them to physical properties	Application
CO5	Explain types of radioactivity, nuclear reactions, and real-life applications	Application

Course -II: INORGANIC CHEMISTRY
Course Code : CHE25202

On Completion of the course, the students will be able to	
CO1	Explain the structures and preparation of key p-block compounds.
CO2	Classify d- and f-block elements and discuss their properties and oxidation states.
CO3	Analyze magnetic, catalytic, and color properties of transition metals.
CO4	Compare and contrast lanthanides and actinides based on electronic configuration.
CO5	Explain and differentiate various metallurgical processes used in the extraction of metals.

Semester-II

COURSE – III, ORGANIC CHEMISTRY

Course Code : CHE25201

On Completion of the course, the students will be able to		Cognitive Domain
CO1	Study Inductive effect, Mesomeric effect, Hyper conjugation and its applications.	Analysis
CO2	Explain the preparation and chemical properties of alkanes, alkenes, alkynes and benzene.	Understanding
CO3	Analyze and apply Huckel's rule to benzenoid and non-benzenoid aromatic compounds.	Analysis
CO4	Differentiate between Markownikoff and Anti-markownikoff addition, Ring activating and deactivating groups.	Application
CO5	Interpret stereochemical representations and identify chiral molecules.	Critical Thinking

Course -IV: PHYSICAL CHEMISTRY-I

Course Code : CHE25202

On Completion of the course, the students will be able to		Cognitive Domain
CO1	Explain gas laws, ideal and real gases behaviour, and critical phenomena	Critical Thinking
CO2	Describe properties of liquids and classify types and applications of liquid crystals.	Application
CO3	Derive Bragg's equation and identify types of crystal defects	Application
CO4	Apply the phase rule to interpret phase diagrams and systems with eutectic/congruent/incongruent points.	Application
CO5	Differentiate between types of adsorption and colloidal systems, and evaluate their applications.	Application

SECONDYEAR, SEMESTER-III

Course Code 5:Fundamentals in Organic Chemistry

Course Code: CHE24301

On Completion of the course, the students will be able to		Cognitive Domain
CO1	Understand and explain the differential behavior of organic Compounds based on fundamental concepts learnt.	Critical Thinking
CO2	Understand chemical properties of alkanes, Conformational analysis of alkanes, cycloalkanes and their relative stability, Baeyer strain theory .	Understanding
CO3	Learn and analyze mechanisms of electrophilic addition reactions	Analysis
CO4	Learn and apply mechanisms of electrophilic aromatic substitution reactions.	Application
CO5	Correlate and describe orientation effect of electrophilic aromatic substitution reactions.	Application

SECONDYEAR, SEMESTER-III

Course Code-6 : Organic Chemistry

Course Code: CHE24302

On Completion of the course, the students will be able to-		Cognitive Domain
CO1	Understand the concept of SN^1 and SN^2 mechanisms and synthesising various Halogen & oxygen containing organic compounds	Understanding
CO2	Describe the reactivity of alcohols and phenols.	Application
CO3	Knowing the mechanisms of the reactions and applying them to synthesize various new compounds	Skill
CO4	To elucidate the mechanistic pathways of reactions involving carboxylic acids and active methylene compounds	Application
CO5	To understand classification of carbohydrates and structural elucidation of glucose & fructose	Skill

SECONDYEAR, SEMESTER-III

Course 7: (Physical chemistry-1) Solutions & Electrochemistry

Course Code: CHE24303

	On Completion of the course, the students will be able to-	Cognitive Domain
CO1	Understand the ideal and non ideal behaviour of solutions	Understanding
CO2	Determination of colligative properties and understanding abnormal colligative properties	Applying
CO3	Discuss the basic concepts of Photochemistry.	Understanding
CO4	Apply the principles of electrical conductivity	Applying
CO5	Explain the importance of emf and its applications	Applying

SECONDYEAR, SEMESTER-III

Course Code-8 : Inorganic & Physical Chemistry

Course Code: CHE24304

On Completion of the course, the students will be able to-		**Cognitive Domain**
CO1	Understand the IUPAC nomenclature for Coordination compounds and apply it for naming these compounds	Understanding
CO2	Analyze Reaction mechanism in Inorganic Chemistry, stereo chemistry of coordination compounds and apply trans effect for synthesis of complexes	Application
CO3	Application and problems on 18 electron rule	Application
CO4	Understand the basic concepts of thermodynamics	Understanding
CO5	Enhance problem solving skills through the application of thermodynamic principles in practical scenarios.	Application

SECOND YEAR, SEMESTER-IV

Course Code-9: Physical Chemistry-II

Course Code : CHE24401

	On Completion of the course, the students will be able to	**Cognitive Domain**
CO1	Explain the difference between solids, liquids and gases in terms of intermolecular interactions.	Critical Thinking
CO2	Understanding of the physical and chemical properties of liquids, including density, viscosity, surface tension and capillarity	Understanding
CO3	Understand the basic concepts of crystallography	Understanding
CO4	Discuss the basic concepts of two component systems	Application
CO5	Through laboratory experiments and projects, students will develop critical thinking and problem solving skills.	Critical thinking

SECOND YEAR, SEMESTER-IV

Course Code-10: General & Physical Chemistry

Course Code : CHE24402

	On Completion of the course, the students will be able to-	Cognitive Domain
CO1	Correlate and describe the stereochemical properties of organic compounds	Applying
CO2	Understand the biological significance of various elements present in the human body	Understanding
CO3	Apply the concepts of ionic equilibrium for the qualitative and quantitative analysis	Analysis
CO4	Determine the order of a chemical reaction and factors effecting order of a reaction	Evaluating
CO5	Understand theories of reacation rates and learn basic concepts of enzyme catalysis	understanding

SECOND YEAR, SEMESTER-IV

Course Code-11 : Nitrogen containing Organic Compounds & Spectroscopy

Course Code : CHE24403

On Completion of the course, the students will be able to-		Cognitive Domain
CO1	Understanding the structure, classification and separation of amines	Understanding
CO2	Analyse the importance of natural products like aminoacids, proteins in biological system and synthesize them	Understanding
CO3	Acquire knowledge about the preparation, applications of Nitrohydrocarbons and Nitrogen Compounds	Applying
CO4	Acquire knowledge about the preparation and application of heterocyclic compounds which enables the synthesis of new organic compound	Understanding
CO5	Apply the concepts of UV and IR to ascertain the functional group in an organic ompound.	Critical thinking

THIRD YEAR, SEMESTER– V

COURSE 12A: Analytical methods in chemistry-Quantitative analysis

Course Code : CHE23501

On Completion of the course, the students will be able to		**Cognitive Domain**
CO1	Demonstrate the usage of common laboratory apparatus used in quantitative analysis.	Understanding
CO2	Acquire knowledge on the basic principles of volumetric analysis and gravimetric analysis	Application
CO3	Gain knowledge on different types of errors	Understanding
CO4	Identify the importance of solvent extraction and ion exchange method	Application
CO5	Understand different water parameters and their determination	Analyzing

THIRD YEAR, SEMESTER– V

Course 13A: Chromatography and Instrumental methods of Analysis

Course code: CHE23502

On Completion of the course, the students will be able to		Cognitive Domain
CO1	Identify the importance of chromatography in the separation and identification of compounds in a mixture	Understanding
CO2	Acquire a critical knowledge on TLC & Paper chromatographic techniques and apply TLC for separation of mixture, to monitor progress of the reaction and Column Chromatography separation	Application
CO3	Acquire a critical knowledge on Column Chromatography & HPLC. Apply these techniques for separation of mixture & identification.	Application
CO4	Understand the principles of spectrophotometry & determine the concentration of metal ion solution using spectrophotometry	Application
CO5	Comprehend the applications of Polarimetry and Refractometry	Knowledge

THIRD YEAR, SEMESTER– V

Course 14B: Industrial Chemistry- Fertilizers and Surface coatings

Course code: CHE23503

On Completion of the course, the students will be able to		Cognitive Domain
CO1	Understand the different types of fertilizers	Understanding
CO2	Identify the importance of different surface coatings	Application
CO3	Acquire a critical knowledge on manufacture of ceramics and cement.	Critical thinking
CO4	Understand various steps in the manufacture of cane sugar.	Understanding
CO5	Explain the manufacture of pulp and paper.	Analysing

THIRD YEAR, SEMESTER– V

Course 15B: Industrial Chemistry-Polymers and Water analysis
Course Code: CHE23504

On Completion of the course the students will be able to		**Cognitive Domain**
CO1	Understand the basic concepts of polymers.	Critical Thinking
CO2	Acquire a critical knowlwdge on the preparation and applications of organic polymers.	Application
CO3	Explain the sources of air pollution.	Application
CO4	Demonstrate the analysis of water quality parameters.	Application
CO5	Identify the importance of industrial waste management.	Application