



**OFFICE OF THE PRINCIPAL, S.K.C.G. (AUTONOMOUS) COLLEGE,  
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**PROGRAMME OUTCOME**

**Department of CHEMISTRY (UG)**

Objectives	Programme Outcome
To enable students gain requisite knowledge and acquire ability to apply them as and when required	On graduation, the student will have the following abilities: a) A fundamental as well as a higher level of understanding, comprehension, analysis and articulation of concepts studied. b) Will have the ability to identify problems/issues and come up with creative solutions.

**SEMESTER - I**

COURSE OUTCOME		Papers	Learning Outcome & ATTAINMENT Level
CO 1	Describe and define the structure of atom, Schrodinger's wave equation, arrangement of electrons in an atom, radial and angular wave function.	Core Course Paper I & II GE 1A	SGPA on basis of Credits earned from MSE (Mid Semester Examinations or CIA-Continuous Internal Assessments) & ESE (End Semester Examinations)
CO 2	Detailed discussion of the periodic properties in a periodic table and its variation in a group and in a period.		
CO 3	Develop a fundamental concept on types of chemical bond forms during compound formation. Which further developed by VSEPR theory the effect of lone pairs and bond pairs that affects the structure of the molecule.		
CO 4	Develop a strong foundational knowledge on kinetic theory of gas, deviation from ideal gas behavior, properties of liquids and the different types of solids.		
CO 5	Have knowledge on electrolytes its types, effects of $P^H$ of solution due to hydrolysis of salts and application of buffer solution along with the role of common ion effect during qualitative analysis of salts.		
CO 6	A student should be able to demonstrate/write comprehensively on any of the topics covered.		

## SEMESTER - II

COURSE OUTCOME		Papers	LO & ATTAINMENT Level
CO 1	Knowledge on basic concepts of organic chemistry, types of electronic displacement and different types of organic reactions along with its mechanisms.	Core Course Paper III & IV GE -2A	SGPA on basis of Credits earned from MSE (Mid Semester Examinations or CIA-Continuous Internal Assessments) & ESE (End Semester Examinations)
CO 2	Ideas on chemistry of alkanes, different isomerisms and configurations on optical isomers.		
CO 3	Illustrate the chemistry of alkenes along with its reaction mechanisms. With the help of the above clearly explains the electrophilic addition reaction in symmetry and asymmetric alkenes.		
CO 4	Acquires knowledge on aromatic compounds and electrophilic aromatic substitution with its mechanism.		
CO 5	Complete description of thermodynamics, its different laws and parameters.		
CO 6	Acquires abilities on the above topics in writing, discuss or write mechanisms, topic specific notes		

## SEMESTER - III

COURSE OUTCOME		PAPERS	LO & ATTAINMENT Level
CO 1	Define and elaborate description about metallurgy, Ellingham diagram.	Core Course Paper V,VI &VII GE -3A	SGPA on basis of Credits earned from MSE (Mid Semester Examinations or CIA-Continuous Internal Assessments) & ESE (End Semester Examinations)
CO 2	Complete elaboration of chemistry of s and p block elements.		
CO 3	Fundamentals on the types of nucleophilic substitution reactions, benzyne mechanism.		
CO 4	Explain with examples of preparation and properties of alcohol, phenol, ether, carbonyl compounds and acids.		
CO 5	Students should be able to understand the concept of phase, component in different solvent systems.		
CO 6	Explain with relevant examples the concept of kinetics in complex reactions, order and molecularity of a reaction and the different factors affects rate of a chemical reactions.		

## SEMESTER IV

COURSE OUTCOME		PAPERS	LO & ATTAINMENT Level
CO 1	Have a clear idea coordination chemistry, ligands, CFT and VBT.	Core Course Paper VIII, IX & X GE -3A	SGPA on basis of Credits earned from MSE (Mid Semester Examinations or CIA-Continuous Internal Assessments) & ESE (End Semester Examinations)
CO 2	Students should be able to know the general characteristic properties of transition elements.		
CO 3	Study and acquire knowledge in the chemistry of Ti, V, Cr, Mn, Fe and Co		
CO 4	Develop comprehensive ideas on nitrogen containing functional groups, diazonium salts, alkaloids and heterocyclic compounds.		
CO 5	Students can briefly understand the concept of conductance and its related theories.		
CO 6	In details the concept of electrochemistry, laws of electrolysis, Concentration cells with and without transference, liquid junction potential; determination of activity coefficients and transference numbers.		

## SEMESTER V

COURSE OUTCOME		PAPERS	LO(Learning Outcome)& ATTAINMENT Level
CO 1	State and explain details on uv, IR , NMR and molecular spectroscopy along with its applications In different fields.	Core Course Paper XI & XII DSE-I & II	SGPA on basis of Credits earned from MSE (Mid Semester Examinations or CIA-Continuous Internal Assessments) & ESE (End Semester Examinations)
CO 2	Detailed concept of Chemical bonding, valence bond and molecular orbital approaches, LCAO- MO treatment of H +. Bonding and antibonding orbitals.		
CO 3	Describe in details about carbohydrates, configuration of glucose and fructose, epimers and anomers, mutarotation.		
CO 4	Details on Quantum mechanical operators, Postulates of quantum mechanics, Schrödinger equation and its application to particle in one-dimensional box and three-dimensional boxes, Qualitative treatment of simple harmonic oscillator .		
CO 5	Complete study on the Properties, manufacture and classification of glass, ceramics, cement. Understand the concept of fertilizers, alloys.		
CO 6	While a student is able to know the basic principles , instrumentation and applications of Flame Atomic Absorption Spectrometry, thermo-gravimetry (TG) and Separation techniques		

## SEMESTER VI

COURSE OUTCOME		PAPERS	Learning Outcome & ATTAINMENT Level
<b>CO 1</b>	Define and describe the Concepts of Definition and classification of organometallic compounds on the basis of bond type, Concept of hapticity, 18 electron rule, Structures of mononuclear and binuclear carbonyls of Cr, Mn, Fe, Co and Ni using VBT. Preparation and structure, evidences of synergic effect in metal carbonyls.	Core Course Paper XIII & XIV DSE-III & DSE IV Project work	SGPA on basis of Credits earned from MSE (Mid Semester Examinations or CIA-Continuous Internal Assessments) & ESE (End Semester Examinations)  The final CGPA attained at the Final Semester is calculated taking all SGPAs of all semester and grading is done to award 1 <sup>st</sup> /2 <sup>nd</sup> Class Honors with Distinction.
<b>CO 2</b>	Study and analyze the Catalysis by Organometallic Compounds - and their mechanism: 1. Alkene hydrogenation (Wilkinson's Catalyst) 2. Hydroformylation (Co salts) 3. Wacker Process 4. Synthetic gasoline (Fischer Tropsch reaction)		
<b>CO 3</b>	Thorough study of nature, types and biosynthesis of Lipids, the process of Biotic and abiotic Nitrogen assimilation and metabolism involved in Amino acid biosynthesis		
<b>CO 4</b>	Define concepts Thermodynamic & kinetic aspects and reaction mechanism of metal complexes, factors affecting stability., Substitution reaction of square planar and octahedral complexes, Trans effect and its applications, theories of trans-effect (electrostatic polarization and Static $\pi$ -Bonding Theory.		
<b>CO 5</b>	Study the concept of Industrial Gases and Inorganic Chemicals, Greenhouse effect and global warming, Ozone depletion by oxides of nitrogen, Hydrological cycle, Water treatment and purification (reverse osmosis, ion exchange). Nuclear fusion/fission,. Nuclear Pollution		
<b>CO 6</b>	Basic concepts of research, general laboratory practices, Data collection and documentation, scientific writing and its presentation through oral, Power Point and Poster methods and how to conceptualize, design and execute a science Project. On completion of all six semesters, a Chemistry Graduate should be able to express, articulate and write scientifically on any of the chapters/Topics mentioned above		