

**GOVERNMENT DEGREE COLLEGE FOR WOMEN
KARIMNAGAR.**

**COURSE OUTCOMES
B.Sc. (Chemistry)
SEMESTER I**

Title of the Paper	Semester I
Course Code	BS 106
Number of Credits	04T+01P
Number of Hours	90 Hours

CO1: Describe the synthesis & list the various types of B, C, Si & N compounds.

CO2: Interpret the diagonal relationship of s block elements & understand physical & chemical reaction of Aliphatic & Alicyclic hydrocarbon.

CO3: Based on bond polarization acidity & basicity & stability of reactive intermediate of different hydrocarbons can be determined.

CO4: By considering principles of solubility product & common ion effect cation can be discriminated by anions in a salt mixture.

CO5: Have an idea of critical & van der Waals constant. By taking the criteria of wave function particle in a 1D box can be explained.

CO6: Predict the bond order & magnetic behaviour for various molecules on the basis of MOED. In a given, mathematical data, accuracy, precision & error can be explained.

CO7: Can understand about the Inorganic Qualitative Analysis. Can identify the Anions and Cations in the given salt mixture by performing systematic procedure.

CO8: Understand the definition of isomers. Classification of isomers. Stereoisomers: enantiomers and diastereomers – Representation of stereoisomers – Wedge, Fischer projection, Sawhorse, Newmann formulae.

CO9: Know the Laws of Crystallography, Definition of space lattice, unit cell. Bravais Lattices and Seven Crystal systems (a brief review). Derivation of Bragg's equation. Can Determine structure of NaCl, KCl and CsCl.

COURSE OUTCOMES
B.Sc. (Chemistry)
SEMESTER II

Title of the Paper	Semester II
Course Code	BS 206
Number of Credits	04T+01P
Number of Hours	90 Hours

CO1: Able to understand the physical and chemical properties of oxides Oxy- acids of zero group, p and d- block elements. Able to Predict the structure of Interhalogens, Pseudo halogens and Polyhalides.

CO2: Acquire Knowledge about various preparation and chemical reactivity of aromatic compounds, halogen compounds and alkyl benzene.

CO3: By kinetic study one can judge the order of reaction of halogen compound & by taking criteria of optical activity one can express the stereochemistry of SN1 &SN2.

CO4: Acquire knowledge of preparation, physical and chemical properties of alcohols, ethers and phenols. Learn various oxidation and reduction reactions of carbonyl compounds. Appreciates various named reactions in organic chemistry.

CO5: Appreciates and learns about the Electrochemistry - Electrical transport – conduction in metals and in electrolyte solutions, specific conductance and equivalent conductance, measurement of equivalent conductance, variation of specific and equivalent conductance with dilution. Kohlrausch’s law, Arrhenius theory of electrolyte dissociation and its limitations, Ostwald’s dilution law, Debye-Huckel-Onsagar’s equation, solubility product of a sparingly soluble salt, conductometric titrations. Nernst equation, Gibbs free energy G, Helmholtz free energy and Equilibrium constant.

CO6: The study of colligative properties helps to determine molecular masses of solutes, Nernst distribution law used to determine association & dissociation of solute in solvent, by using Bragg’s equation various crystal structure can be determined & by qualitative analysis one can determine the weight of chemical substances.

COURSE OUTCOMES
B.Sc. (Chemistry)
SEMESTER III

Title of the Paper	Semester III
Course Code	BS 206
Number of Credits	04T+01P
Number of Hours	90 Hours

CO1: Defines the properties of f-block elements and non-aqueous solvents

CO2: Gains knowledge about the coordinate complexes. Nomenclature – IUPAC rules, Various theories of coordination chemistry and Isomerism in coordination compounds.

CO3: Learns about the Preparation and properties of Metal carbonyls, Definition, nomenclature and classification of organometallic compounds.

CO4: Learns about the Preparation and Properties of the Carboxylic Acids and their derivatives, Nitro hydrocarbons, Amines, Cyanides and Isocyanides. Gains knowledge about the important Named Reactions.

CO5: Understands the concept of system, variables, heat, work and laws of thermo dynamics, concept of entropy, reversible, irreversible processes. Calculation of entropy using 3rd law of thermodynamics, Joule Thompson effect, partial molar quantities, Free energy Gibbs function (G) and Helmholtz's function (A) as thermodynamic quantities. Derivation of equation $\Delta G = \Delta H - T\Delta S$. Gibbs equations and Maxwell relations. Variation of G with P, V and T.

CO6: Significant figures, accuracy and precision. Errors-classification of errors- determinate and indeterminate errors, absolute and relative errors. Mean, Median, Range, Standard deviation.

CO7: Understands the Phases, Components, Gibbs Phase Rule, Phase Diagrams and Applications.

CO8: Understands the concept of stability of carbanions: Aldol reaction, Perkin reaction, Benzoin condensation, haloform reaction, conversion of smaller alkynes to higher alkynes.

COURSE OUTCOMES
B.Sc. (Chemistry)
SEMESTER IV

Title of the Paper	Semester IV
Course Code	BS 306
Number of Credits	04T+01P
Number of Hours	90 Hours

CO1: Understands the concept of Crystal Field Theory and d-Orbital splitting pattern, High Spin and Low spin Complexes. HSAB Principle. Determines the stability of complexes and stability constants using Jobs method.

CO2: Gains knowledge about essential elements, biological significance of Na, K, Mg, Ca, Fe, Co, Ni, Cu, Zn and chloride. Toxic metal ions As, Hg & Pb Structure of chlorophyll and coordination of magnesium. Electron transport in light reactions from water to NADP⁺ (Z – scheme).

CO3: Learns about the Carbohydrates Glucose and Fructose their structure determination and properties.

CO4: Learns about the Classification. Methods of synthesis: General methods of synthesis of alpha amino acids. Zwitter ion structure, definition of isoelectric point. Primary structure of proteins, di peptide synthesis.

CO5: Understands the Heterocyclic Compounds 5 membered ring compounds with one hetero atom Ex. Furan. Thiophene and pyrrole. Importance of ring systems –Numbering. Aromatic character.

CO6: Understand the basics of chemical kinetics, determination of order and molecularity of the reactions. Understands the theories of reaction rates. Determination of rate of opposing/parallel/chain reactions with suitable examples..

CO7: Understands the concept of photochemical reactions, Difference between thermal and photochemical reactions, Laws of photo chemistry, Quantum yield. Jablonski diagram. Explanation of internal conversion, inter-system crossing, phosphorescence, fluorescence.

CO8: Understands the Theories of bonding in metals conductors, semiconductors n-type and p-type, extrinsic & intrinsic semiconductors, and insulators.

CO9: Defines the colloids, Understands the Classification of colloids. Preparations and properties, Hardy– Schultz law, Gold number. Emulsions, preparation and emulsifier. Adsorption isotherms Freundlich adsorption isotherm. Langmuir adsorption isotherm.

CO10: Practically learns the Qualitative Analysis of Organic Compounds

Title of the Paper	REMEDIAL METHODS FOR POLLUTION, DRINKING WATER AND SOIL FERTILITY STANDARDS
Course Code	BS 301
Number of Credits	02
Number of Hours	30 Hours

CO1: Gains knowledge about the Pollution Prevention and control of air pollution.

CO2: Understands the Water Quality and Common Treatments for Private Drinking Water Systems. Soil Chemistry, Effect of pH on nutrient availability. Macronutrients, Macronutrients. Determination of soil nitrogen by Kjeldahl method.

Title of the Paper	Materials and their Applications
Course Code	BS 401
Number of Credits	02
Number of Hours	30 Hours

CO1: Understands the Materials and their importance. Types of Materials: Metals, ceramics, polymers and composites.

CO2: Classifies of Polymeric materials based on application: Coatings, adhesives, films, foams, Fillers, Plasticizers, Stabilizers, Colorants, Flame Retardants, Advanced Materials: semiconductors, bio-compatible materials, smart materials, advanced polymeric materials and nano-engineered materials.

COURSE OUTCOMES
B.Sc. (Chemistry)
SEMESTER V

Title of the Paper	Spectroscopy and Chromatography
Course Code	BS 506
Number of Credits	04T+01P
Number of Hours	90 Hours

CO1: Understands the basic principles of Spectroscopy, Rotational Spectroscopy, UV-Visible Spectroscopy, Electronic Spectroscopy.

CO2: Understands the Basic Principles of NMR Spectroscopy and its application.

CO3: Understands the Basic Principles of Mass Spectroscopy and its application.

CO4: Solving the problems related to different spectroscopic techniques.

CO5: Understands the Instrumental methods of analysis. Solvent extraction method and different chromatographic techniques like TLC, Column Chromatography, GC, HPLC etc.

B.Sc. (Chemistry)
SEMESTER V
(GE Paper)

Title of the Paper	Chemistry of Cosmetics, Food Processing, Drugs and Pharmaceuticals
Course Code	BS 501
Number of Credits	04
Number of Hours	60 Hours

CO1: Understands the preparation and uses of Hair dye, hair Spray, Shampoo, Sunscreen Lotion, Lipsticks, Talcum Powder, Nail enamel, Cold & Vanishing Creams, Shaving Cream

CO2: Understands the chemistry involved in food processing, food adulteration, food packaging and importance of labelling.

CO3: Understands the Terminology of Drugs. Drug Design and Synthesis of Drugs. Drug Metabolism and Classification of Drugs.

COURSE OUTCOMES
B.Sc. (Chemistry)
SEMESTER VI

Title of the Paper	Medicinal Chemistry
Course Code	BS 606
Number of Credits	04T+01P
Number of Hours	90 Hours

CO1: Understands the terminology of Medicinal Chemistry. Absorption, Diffusion, Metabolism, Excretion and Toxicology of Drugs. Classification and nomenclature of Drugs.

CO2: Gains knowledge about the Receptors and Enzymes.

CO3: Learns about the synthesis and therapeutic activity of various drugs.

CO4: Understands molecular messengers, vitamins and micronutrients.