Programme outcomes: B Sc Industrial Chemistry

PO1. **Chemical Sciences knowledge**: Apply the knowledge of chemical science, chemistry fundamentals and specialization to the solution of complex chemical science problems.

PO2. **Problem analysis:** Identify, formulate, research literature, and analyze complex chemistry problems reaching substantiated conclusions using principles of chemical sciences.

PO3Design/development of solutions: Design solutions for complex chemistry problems and design processes that meet the specified needs with appropriate consideration for the public health and safety, and for the cultural, societal, and environmental considerations.

PO4Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions on certain chemical problems.

PO5Modern tool usage: Apply appropriate techniques, resources and modern softwaretools including prediction and modeling to chemical science activities with an understanding of the limitations.

PO6The Chemist and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional chemical practice.

PO7Environment and sustainability: Understand the impactof the professional chemistry solutions in societal andenvironmental contexts, and demonstrate the knowledge and need for sustainable development.

Programme Specific Outcomes : B.Sc Industrial Chemistry

- **PSO 1:** Students will be able to understand the basic concepts of inorganic, organic, physical industrial chemistry along with emphasis on green chemistry.
- **PSO 2:** Students will develop theability to present chemical research by means of an oral presentation, a scientific poster or a written report.
- **PSO 3:** Students will be able to use and apply professional software's relevant to chemistry.
- **PSO 4:** Students will be able to apply the fundamental and specialized knowledge of chemistry to own start ups or professional practice.
- **PSO 5:** Perform procedures as per laboratory standards in the areas of Inorganic, organic, industrial, natural products and dyes chemistry.
- **PSO6:** Students will be able to apply analytical tools for determination of organic molecules.
- **PSO7:** Students will have additional knowledge on natural products chemistry, colour chemistry and medicinal chemistr

B.Sc Industrial Chemistry :Course Outcome

The branch of chemistry which applies physical and chemical procedures towards the transformation of natural raw material and their derivatives to products that are of benefits to humanity.

B.Sc Part I

Paper I

CO1 - Discussion about nomenclature in chemistry and raw materials for organic compound.

CO2 - Study on petrolutri i.e. cracking , reforming etc. and types, structure, properties and modification of coals.

CO3 - Study on renewable natural resources and knowledge about basic metallurgical operations.

CO4 - Discussions on physic chemical principles of extraction of iron, copper,lead, silver, sodium etc.

CO5 - Study on inorganic materials of industrial importance.

Paper II

CO6 - Study on surface chemistry and interfacial phenomena, adsorption isotherm, sols, gels.emulsions etc.

CO7 - Discussions about types, principles, mechanisms and factors affecting catalysis process.

CO8 - Study on enzyme catalysed reactions and material balance without chemical reactions.

CO9 - Knowledge on dimensions and units, basic chemical calculations and material balance involving chemical reactions.

CO10 - Study of heat capacity of pure gases and gaseous mixtures and discussion on sensible heat changes.

Paper III

CO11 - Study about distillation and absorption.

CO12 - Discussions on evaporators and evaporation process, filtration process and also study on drying.

CO13 - Knowledge on various utilities in chemical industry i.e. fuels, boilers, water, steam and air.

CO14 - Stuay about flow of fluids .discussions on pumps i.e. gear pump, centrifugal pumps etc.

CO15 - Study on various types of heat exchangers.

B.Sc. Part II

Paper I

CO1 - Study about material science, material of constructions used in industry,metals ,alloys, cement and ceramics.

CO2 - Discussions on industrial polymers and composite materials.

CO3 - Study on composition ,manufacture , properties of glass,also study on corrosion types and their mechanism.

CO4 - Evaluation of various types of pollution and their statutory limits.

CO5 - Analysis of various pollutants in sewage, pesticide etc.

Paper II

CO6 - Study on unit processes in organic chemicals manufacture i.e. nitration.

CO7 - Detailed study on halogenations reaction and their mechanisms with examples.

CO8 - Study about sulphonating agents,kinetics of sulphonation reactions with examples.

CO9 - Study related to effluent treatment and waste management plans.

CO10 - Discussions on some pollution control devices and pollution control plans.

Paper III

CO11 - Study of types of oxidation reactions , their kinetics and mechanism involving liquid phase oxidation, vapour phase oxidation etc.

CO12 - Study of kinetics and thermodynamics of hydrogenation and alkylation .

CO13 - Knowledge on esterification reactions,amination reactions by reduction and aminolysis and study of hydrolysis reactions.

CO14 - To study process instrumentation, measuring apparatus for temperature and pressure i.e.thermometers,pressure gauges etc.

CO15 - Discussions on liuid level measurement by direct- indirect and float methods.

B.Sc Part III

Paper I

CO1- Study on project cost estimation,capital formation and elements of cost accounting.

CO2 - Study on chemical process economics involving interest and investment cost, depreciation, taxes, marketing policy.

CO3 - Study related to profitability criteria,sampling techniques, variations,collection and processing dataetc.

CO4 - Concepts on scientific management in industry,its functions,decision making,planning,organization and location of industry,

CO5 -Study on material management and inventory control including resource management and welfare.

Paper II

CO6 - Study on history of pharmaceuticals development and pharmacopoeias.

CO7 - Discussions on the process involing development of pharmaceutical drugs and contents added in them like anti oxidants etc.

CO8 - Discussions on pharmaceuticals quality control and packaging processes and also some legal aspects related to it.

CO9 - Evaluation of crude drugs, discussions on chromatography i.e. paper chromatography,TLC,HPLC,GLC etc.

CO10 - Study about some instrumentation i.e. UV-Visible,IR,X-Ray etc.

Paper III

CO11 - Study on phytochemical drugs ,classification,raw materials,process of manufacture their handling.

CO12 - Study about chemical constitution of plants and their various isolation procedures.

CO13 - Study about antimicrobials,analgesic-antiinflamatory and steroid harmones.

CO14 - Discussions on vitamins, barbiturates, blockers, cardiovascular agent and antihistamins.

CO15 - Study on fermentation, manufacture of antibiotics and enzyme transformation.