

## Department of Chemistry

Session 2020-21



### EXPECTED LEARNING OUTCOMES

#### B.Sc. (Subject - Industrial Chemistry)

#### PROGRAM OUTCOMES

- Students will have a basic knowledge of fundamentals and application of current chemical and scientific theories.
- Students will be able to record and analyze the results of experiments.
- Student will know about material balance, metal and alloys, manufacturing process important for industries.
- Students will learn about chemical processes and industrial economics.
- Students will be skilled in problem solving, critical thinking and analytical.
- Students will understand the central role of chemistry in our society.
- Students will become aware of the ethical behavior in issues facing chemists.

#### PROGRAM SPECIFIC OUTCOME

The purpose of the B.Sc. (Industrial Chemistry) program at Govt. Digvijay PG Autonomous college is to provide the key knowledge, base and laboratory resources to prepare students for achieving their career goals as professionals in the field of chemistry, biological chemistry and related fields. They will be able to work as chemists and technicians in different laboratories, industries, pollution control agencies, etc.

#### **B.Sc. I (INDUSTRIAL CHEMISTRY)**

#### **PAPER- I : INDUSTRIAL ASPECTS OF ORGANIC & INORGANIC CHEMISTRY**

- Student will learn by this unit chemical name and chemical composition or structure of any raw material or products.
- Student know about crude material of petroleum and coal.
- Natural resource of products, student know about extraction of raw chemical and its metallurgical process.
- Extraction process of earth metals.
- Industrial important raw material

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## **PAPER- II : INDUSTRIAL ASPECTS OF PHYSICAL CHEMISTRY, MATERIAL AND ENERGY BALANCE**

- Study about atom, molecule, product surface nature and its activity use for soap, shampoo, detergent, gel productions.
- Student will learn about catalyst type material and its use in production.
- Industrially physical working process of material and separation of pure material in industry.
- Students know standard and dimensions unit about material balancing in final production process.
- Material composition changes between process one to another phase.

## **PAPER- III : UNIT OPERATION IN CHEMICAL INDUSTRY AND UTILITIES, FLUID FLOW AND HEAT TRANSPORT IN INDUSTRY**

- Student will know about all type of distillation and absorptions equipments, working and handling process.
- Student learn about many type dryers, evaporators, filters equipments and workings benefits in industries.
- What is utility role in plants and its products handling process.
- All type of pumps and fluid flow pumps working process or important in plants.
- Heat exchanger process and its device working properties in industries.

## **LABORATORY COURSE**

- Students will learn by this year practical how to doing any simple laboratory techniques like distillation process, boiling point, melting point, extraction process, manufacturing of standard solutions, and calibration of machine chromatography techniques, surface tensions process and refractive index process mainly safety process.

## **B. Sc. II (INDUSTRIAL CHEMISTRY)**

### **PAPER- I : MATERIAL SCIENCE AND ENVIRONMENTAL STUDIES**

- Material of construction and use in industry, cement, ceramic, metals manufacturing process.
- Polymer manufacturing process in industries and natural polymer extraction.
- Glass manufacturing in industries and corrosion process in metal or other surface.
- Pollution and its pollutants.
- Advance knowledge about air pollutions.

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## **PAPER- II : ORGANIC CHEMICALS MANUFACTURING AND WASTE MANAGEMENT**

- Nitration process in industries for manufacturing of nitro aromatic chemical, explosive other etc.
- Important industrial uses of radicals halogenations process include direct chlorination and allelic chlorination.
- Sulfonation process used in electrophilic aromatic substitution used for detergents, dye and drugs.
- Water treatment plant process and aerobic and anaerobic type treatment process.
- Multiple instrument using in industries and industrials shifty process.

## **PAPER- III : ORGANIC SYNTHESIS AND INDUSTRIAL INSTRUMENTATIONS**

- Student will learn how to catalytic oxidation done remediation of pollutants, production of valuable chemicals used in water treatment.
- Hydrocarbons used in food industry like unsaturated vegetable oils and fats.
- Esterification used in polymer manufacturing industry, soaps, synthetic rubber, paints, varnishes, medicines, dyes.
- Student will learn real time measurement and control of process such as level, flow, pressure, temperature, ph, humidity.
- Pressure transmitter determine liquid level in a tank. many type equipments process in industries.

## **LABORATORY COURSE**

- Student will learn by this year practical unit process like nitration polymerization process, many type instrument methods uses in industry. material testing, process of any instrument work in plant and water treatment process.

## **B. Sc. III (INDUSTRIAL CHEMISTRY)**

### **PAPER- I : CHEMICAL PROCESS AND INDUSTRIAL ECONOMICS**

- Student will know chemical estimation and cost accounting.
- Student will learn marketing policy, cost value, taxes on export or imports on material.
- Industrial sampling purchasing, raw material, collection data from area to area, particle and material determination. student know about quality assurance department and management about QA & QC .
- Industrial application, planning for material production or quality parameter control location for setup any industries.
- Safety management ,welfare the human resources.

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## PAPER- II : PHARMACEUTICALS

- Student will learn the pure history about Pharmaceuticals parameter, type for using routes of administration.
- It will help in nursing and sterilization process, and Pharma industry and additives in medicine.
- Student will know about packaging and quality control process for raw material. F.D.A. process.
- Crude product for manufacturing pharmacy. all type chromatography process.
- Instruments handling on laboratory for analysis of material raw & final.

## PAPER- III : DRUGS

- Student will know about effluent handling ,collection and cultivation of photochemical plants.
- Chemical constitution about isolation procedures for ingredients of medicine.
- Student will know about antimicrobial, analgesic, steroidal hormones drug.
- Student know about vitamin, barbiturates, blockers, cardiovascular, antihistamines medicine, role of its metabolism of medicine.
- Student know how to manufacturing of penicillin, vitamins, steroidal drug. its use or microbial effect. fermentation process.

## LABORATORY COURSE

- Student will know how to manufacturing industrials compound like Benzes amide, aldehyde, alcohol, fatty oil and acid. determination of material packaging material.
- Limit test heavy metals & two representing bulk drug.
- Acidimetric and alkalimetry formulation of this type analysis. microbiological and antimicrobial testing zone and cup method.
- Know about TLC method for determination of few drug.

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