

VV GIRI GOVERNMENT DEGREE COLLEGE, DUMPAGADAPA

Department of Chemistry- 2022-23

Title of the Paper: Inorganic & Physical Chemistry

Semester: I (60 Hr)

Course outcomes:

- At the end of the course, the student will be able to;
- **CO1.** Understand the basic concepts of p-block elements.
- **CO2.** To compare the periodic properties of d and f block elements and explain the bonding and structures of metal carbonyls.
- **CO3.** To understand the properties and structure of Solid state.
- **CO4.** To understand the properties of gaseous and liquid states.
- **CO5.** To explain the properties of Solutions.

Practical-I ANALYSIS OF SALT MIXTURE

Course outcomes: At the end of the course, the student will be able to;

CO1. Understand the basic concepts of qualitative analysis of inorganic mixture

CO2. Use glassware, equipment and chemicals and follow experimental procedures in the laboratory

CO3. Apply the concepts of common ion effect, solubility product and concepts related to qualitative analysis.

Title of the Paper: ORGANIC AND GENERAL CHEMISTRY

Semester: II

Course outcomes: At the end of the course, the student will be able to;

CO1. Understand and explain the differential behaviour of organic compounds based on fundamental concepts learnt.

CO2. Formulate the mechanism of organic reactions by recalling and correlating the fundamental properties of the reactants involved.

CO3. Learn and identify many organic reaction mechanisms including Free Radical Substitution, Electrophilic Addition and Electrophilic Aromatic Substitution.

CO4. Understand the concepts of absorption and adsorption, colloidal chemistry and nature of Chemical Bonding.

CO5. Correlate and describe the stereo chemical properties of organic compounds and reactions.

Practical Paper – II: Volumetric Analysis

Course outcomes:

At the end of the course, the student will be able to;

CO1. Use glassware, equipment and chemicals and follow experimental procedures in the laboratory

CO2. Understand and explain the volumetric analysis based on fundamental concepts learnt in ionic Equilibria

CO3. Learn and identify the concepts of standard solutions, primary and secondary standards

CO4. Facilitate the learner to make solutions of various molar concentrations. This may include: The concept of the mole; Converting moles to grams; Converting grams to moles; Defining concentration; Dilution of Solutions; Making different molar concentrations.

Title of the Paper: Organic Chemistry & Spectroscopy Semester: III (60 Hr)

Course Outcomes:

At the end of this course, students should be able to:

- **CO1:** Remember the preparations, properties and reactions of halo alkanes, halo arenes and oxygen containing functional groups.
- **CO2:** Understand preparation, properties and reactions of carbonyl compounds.
- **CO3:** Apply preparation methods for carboxylic acids and their derivatives.
- **CO4:** Analyze various molecules and polyatomic molecules using different spectroscopy methods.
- **CO5:** Evaluate the functional groups of different organic compounds. Create applications of spectroscopy for various organic molecules.

Semester: III

Hours Taught: 30 hrs. (2hr/W)

Practical title: Basics of Organic Preparations and IR Spectroscopy

Course Outcomes: At the end of this course, students should be able to:

- **CO1:** How to calculate limiting reagent, theoretical yield, and percent yield
- **CO2:** How to perform common laboratory techniques including reflux, distillation, recrystallization, vacuum filtration.
- **CO3:** How to critically evaluate data collected to determine the identity, purity, and percent yield of products and to summarize findings in writing in a clear and concise manner.

Title of the Paper: INORGANIC, ORGANIC AND PHYSICAL CHEMISTRY Semester: IV

Course Outcomes: At the end of the course, the student will be able to:

- **CO1:** To learn about applications of Organ metallic Compounds
- **CO2:** To learn about classification of Carbohydrates
- **CO3:** To understand the concept of Amino acids and proteins
- **CO4:** To learn about the laws of absorption of light energy by molecules and the subsequent photochemical reactions.
- **CO5:** To understand the concept of quantum efficiency and mechanisms of photochemical reactions

Practical Paper – IV: Organic Qualitative analysis

Course outcomes:

At the end of the course, the student will be able to;

- **CO1:** Use glassware, equipment and chemicals and follow experimental procedures in the laboratory.
- **CO2:** Determine melting and boiling points of organic compounds
- **CO3:** Understand the application of concepts of different organic reactions studied in theory part of organic chemistry.

Title of the Paper: INORGANIC & PHYSICAL CHEMISTRY Semester: IV

Course outcomes:

At the end of the course, the student will be able to;

- **CO1:** Understand concepts of Coordination Chemistry **and** Inorganic Reaction Mechanism.
- **CO2:** Understand concepts of Phase Rull and Phase diagram.
- **CO3:** Understand concepts of boundary conditions and quantization, probability distribution, most probable values, uncertainty and expectation value
- **CO4:** Application of quantization to spectroscopy.
- **CO5:** Various types of spectra and their use in structure determination.

Practical Paper – V: Conductometric and Potentiometric Titrimetry

Course outcomes:

At the end of the course, the student will be able to;

- **CO1:** Use glassware, equipment and chemicals and follow experimental procedures in the laboratory
- **CO2:** Apply concepts of electrochemistry in experiments.
- **CO3:** Be familiar with electro analytical methods and techniques in analytical chemistry which study an analyte by measuring the potential (volts) and/or current (amperes) in an electrochemical cell containing the analyte.

Title of the Paper: Analytical Methods in Chemistry-I

Semester: V

Course Outcomes:

Students after successful completion of the course will be able to:

- **CO1.** Remember the basic concepts of quantitative analysis data treatment, separation techniques and analysis of water.
- **CO2.** Acquire knowledge on the concepts quantitative analysis data treatment, separation techniques and analysis of water.
- **CO3.** Apply the conceptual knowledge gained in the areas of quantitative analysis data treatment, separation techniques and analysis of water in the chosen job role.
- **CO4.** Analyse that how far the quantitative methods, data treatment methods separation techniques and Analysis of water

Analytical methods in Chemistry-1-PRACTICAL

Course Outcomes:

On successful completion of this practical course, student shall be able to:

- **CO1.** Estimate Iron (II) using standard Potassium dichromate solution (PO1)
- **CO2.** Learn the procedure for the estimation of total hardness of water (PO7)
- **CO3.** Demonstrate the determination of chloride using Mohr's method (PO1, PO7)

- **CO4.** Acquire skills in the operation and calibration of pH meter (PO1)

Title of the Paper: Analytical Methods in Chemistry-2

Semester: V

Course Outcomes:

Students after successful completion of the course will be able to:

- **CO1.** Remember the basic concepts of Chromatography like paper, TLC, Column, GC & HPLC.
- **CO2.** Understand the significance of paper, TLC, Column, GC & HPLC in separation and identification of compounds.
- **CO3.** Apply the conceptual knowledge gained in the techniques of chromatography in separating and identifying the chemical compounds as and when required.
- **CO4.** Analyze that how far one chromatographic technique is much use full in separation and identification of compounds over the other chromatographic technique.

Analytical methods in Chemistry-2

PRACTICAL :Chromatography

Course Outcomes:

On successful completion of this practical course, student shall be able to:

- CO1.** Perform the separation of a given dye mixture using TLC (PO1)
- CO2.** Learn the preparation of TLC plates (PO1, PO7)
- CO3.** Demonstrate the separation of mixture of amino acids using paper chromatography (PO1)
- CO4.** Acquire skills in using column chromatography for the separation of dye mixture (PO7)