

SPACES DEGREE COLLEGE, PAYAKARAOPETA

COURSE & PROGRAM OUTCOMES OF CHEMISTRY (B.SC.) UNDER CBCS

The CBCS Course curriculum of the discipline of Chemistry is well designed and very promising. The core course would help to enrich the subject knowledge of the students and increase their confidence level in the field of both academia and industry. Generic electives make integration among various interdisciplinary courses to fulfill the vision and mission of designing the course. The introduction of Skill Enhancement Courses (SEC) would help to gain more powerful knowledge not only in their core Chemistry subject but also in interrelated multidisciplinary subjects both theoretically and practically. The inclusion of Discipline Specific Courses (DSE) has brought an opportunity in front of students to gain knowledge on various naturally and industrially important useful materials and also helps them to familiar and expert in handling different chemistry based software after proper training. In brief the student graduated with this type of curriculum would be able to disseminate subject knowledge along with necessary skills to suffice their capabilities for academia, entrepreneurship and industry.

After careful analysis of the course, the department of Chemistry has pointed out the following outcomes of the course.

Course Outcomes

| Semester | Course Code | Course Outcomes |
|----------|-------------|---|
| SEM-1 | CC-1 | INORGANIC AND PHYSICAL CHEMISTRY CO-1: To Understand the basic concepts of p-block elements, d- block elements, f- block elements and theories of bonding in metals. CO-2: Explain the difference between solid, liquid and gases in terms of intermolecular interactions. CO-3: Apply the concepts of gas equations like Vanderwaal's gas equation CO-4: To understand the concepts of critical constants, isotherms of CO ₂ , liquefaction of gases and liquid crystals. CO-5: To understand the concepts of solids like crystal systems, Bravais Lattice, Laws of Crystallography, Crystal Planes, Bragg's equation and defects in crystals. CO-6: To understand CST, azeotropic mixtures, colligative properties and solubility product |


PRINCIPAL
SPACES DEGREE COLLEGE,
PAYAKARAOPETA



| | | |
|-------|------|---|
| SEM-1 | CC-2 | <p>ANALYSIS OF SALT MIXTURE</p> <p>CO-1: To Understand the basic concepts of qualitative analysis of inorganic mixture.</p> <p>CO-2: Use glassware, equipment and chemicals and follow experimental procedures in the laboratory</p> <p>CO-3: Apply the concepts of common ion-effect, solubility product and concepts related to qualitative analysis.</p> |
| SEM-2 | CC-3 | <p>ORGANIC & GENERAL CHEMISTRY</p> <p>CO-1: To learn in detail about the synthesis, properties, chemical reactions and reaction mechanisms of alkenes and alkynes</p> <p>CO-2: To understand about different types of electrophilic and nucleophilic aromatic substitution reactions, reaction intermediates and their mechanisms</p> <p>CO-4: To Understand and explain the differential Behavior of organic compounds based on fundamental concepts learnt.</p> <p>CO-5: Formulate the mechanism of organic reactions by recalling and correlating the fundamental properties of the reactants involved.</p> <p>CO-5: To learn and identify many organic reaction mechanisms including Free Radical Substitution, Electrophilic Addition and Electrophilic Aromatic Substitution.</p> <p>CO-6: Correlate and describe the stereo chemical properties of organic compounds and reactions.</p> |
| | CC-4 | <p>VOLUMETRIC ANALYSIS</p> <p>CO-1: To use glassware, equipment and chemicals and follow experimental procedures in the laboratory</p> <p>CO-2: To understand and explain the volumetric analysis based on fundamental concepts learnt in ionic equilibria.</p> <p>CO-3: To learn and identify the concepts of a standard solutions, primary and secondary standards.</p> <p>CO-4: Facilitate the learner to make solutions of various molar concentrations.</p> <p>CO-5: To learn the concept of the mole; Converting moles to grams; Converting grams to moles; Defining concentration; Dilution of Solutions; Making different molar concentrations</p> |


PRINCIPAL
SPACES DEGREE COLLEGE,
PAYAKARAOPETA



| | | |
|-------|------|--|
| SEM-3 | CC-5 | <p>ORGANIC CHEMISTRY & SPECTROSCOPY CO-1: Understand preparation, properties and reactions of halo alkanes, halo arenes and oxygen containing functional groups. CO-2 : Use the synthetic chemistry learnt in the course to do functional group transformations. CO-3: To propose possible mechanism for any relevant reaction</p> <p>CO-4: To study the fundamental laws of spectroscopy and Selection rules, to know the basic principles of Instrumentation for UV-visible spectroscopy, Infra-red spectroscopy and NMR spectroscopy and their use for the determination of structure of a compound quantitative analysis of geometrical isomers and keto-enol tautomerism.</p> |
| | CC-6 | <p>ORGANIC PREPARATIONS & IR-SPECTRAL ANALYSIS CO-1: To how to use glassware, equipment and chemicals and following experimental procedures in the laboratory CO-2: To how to calculate limiting reagent, theoretical yield, and percent yield CO-3: To how to engage in safe laboratory practices by handling laboratory glassware, equipment, and chemical reagents appropriately CO-4 : To how to dispose of chemicals in a safe and responsible manner CO-5: To how to perform common laboratory techniques including reflux, distillation, recrystallization, vacuum filtration. CO-6: To how to create and carryout work up and separation procedures CO-7 To 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</p> |
| SEM-4 | CC-7 | <p>INORGANIC, ORGANIC & PHYSICAL CHEMISTRY CO-1: To learn about the laws of absorption of light energy by molecules and the subsequent photochemical reactions. CO-2 : To understand the concept of quantum efficiency and mechanisms of photochemical reactions.</p> |
| | CC-8 | <p>ORGANIC QUALITATIVE ANALYSIS CO-1: To use glassware, equipment and chemicals and follow experimental procedures in the laboratory CO-2: To determine melting and boiling points of organic compounds CO-3 : To understand the application of concepts of different organic reactions studied in theory part of organic chemistry</p> |


PRINCIPAL
SPACES DEGREE COLLEGE,
PAYAKARAOPETA



| | | |
|--------|-------|--|
| SEM-IV | CC-9 | INORGANIC & PHYSICAL CHEMISTRY CO-1: To understand concepts of boundary conditions and quantization, probability distribution, most probable values, uncertainty and expectation values CO-2 : Application of quantization to spectroscopy. CO-3: To Various types of spectra and their use in structure determination. CO-4 : To understand concepts of coordination chemistry and theories in co-ordination chemistry. |
| | CC-10 | CONDUCTOMETRIC AND POTENTIOMETRY TITRIMETRY CO-1 : To use glassware, equipment and chemicals and follow experimental procedures in the laboratory CO-2 : To apply concepts of electrochemistry in experiments CO-3: 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 |
| | CC-11 | ANALYTICAL METHODS IN CHEMISTRY-1(SKILL ENHANCEMENT COURSE (ELECTIVE)) Students after successful completion of the course will be able to: CO-1: To identify the importance of solvent extraction and ion exchange method. CO-2: To acquire knowledge on the basic principles of volumetric analysis and gravimetric analysis. CO-3: To demonstrate the usage of common laboratory apparatus used in quantitative analysis. CO-4: To understand the theories of different types of titrations. CO-5: To gain knowledge on different types of errors and the in minimization methods. CO-6: To understand the hardness of water and why cause hardness and removal methods. |
| | CC-12 | ANALYTICAL METHODS IN CHEMISTRY-1 CO-1: To estimate Iron (II) using standard Potassium dichromate solution CO-2: To learn the procedure for the estimation of total hardness of water CO-3: To demonstrate the determination of chloride using Mohr's method CO-4: To acquire skills in the operation and calibration of pH meter Perform the strong acid vs strong base titration using pH meter |


PRINCIPAL
SPACES DEGREE COLLEGE,
PAYAKARAOPETA



CC-13

ANALYTICAL METHODS IN CHEMISTRY-2(SKILL ENHANCEMENT COURSE (ELECTIVE)

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

CO-1: To identify the importance of chromatography in the separation and identification of compounds in a mixture

CO-2: To acquire a critical knowledge on various chromatographic techniques.

CO-3: To demonstrate skills related to analysis of water using different techniques.

CO-4: To understand the principles of spectro chemistry in the determination of metal ions.

CO-5: Comprehend the applications of atomic spectroscopy.




PRINCIPAL
SPACES DEGREE COLLEGE,
PAYAKARAOPETA

| | | |
|-------|-------|--|
| SEM-5 | CC-14 | <p>ANALYTICAL METHODS IN CHEMISTRY-2</p> <p>On successful completion of this practical course, students shall be able to:</p> <p>CO-1: To perform the separation of a given dye mixture using TLC</p> <p>CO-2: To learn the preparation of TLC plates</p> <p>CO-3: To demonstrate the separation of mixture of amino acids using paper chromatography</p> <p>CO-4: To acquire skills in using column chromatography for the separation of dye mixture</p> |
|-------|-------|--|




PRINCIPAL
SPACES DEGREE COLLEGE,
PAYAKARAOPETA