



SMT N P S GOVT COLLEGE (W), CHITTOOR



DEPARTMENT OF CHEMISTRY

B.SC

(Revised on 2021-2022)

COURSE OUTCOMES

The chemistry course curriculum for the undergraduates includes the main areas of chemistry: organic, inorganic, physical and general chemistry. The purpose of the program is to provide the key knowledge base and laboratory resources to prepare students for careers as professionals in the field of chemistry. The department of chemistry works towards the development in the fundamentals and application of current chemical and scientific theories. The students are taught how to design and carry out scientific experiments as well as accurately record and analyze the results of such experiments. The course is so designed that the students understand the central role of chemistry in our society and become potent enough to explore new areas of research both in chemistry and in allied fields of research and technology. They are familiar with application of safety and chemical hygiene regulations and practices. They are able to understand the chemical basis for biological phenomena and cellular structure and how physiological conditions influence the structures and reactivities of biomolecules.

They are able to use modern library searching and retrieval methods to obtain information about a topic, chemical, chemical technique, or an issue relating to chemistry. The students have effective written and oral communication skills, especially the ability to transmit complex technical information in a clear and concise manner. They will have an ability to work effectively in diverse teams in both classroom and laboratory. They are able to conduct experiments, analyze data, and interpret results, while observing responsible and ethical scientific conduct.

Semester-1: Course Code:3-1-106 : (INORGANIC,& PHYSICAL CHEMISTRY)

1. At the end of the course, the student will be able to Understand the basic concepts of P-Block elements. After learning 'P-block elements', students are expected to recall the various definitions, concepts related to them and apply these concepts as and when required. Realize, the industrial significance of these elements and their compounds.

2. Understand the differences between solid, Liquid and gases in terms of intermolecular interactions. Learning 'Gaseous state' by students empowers them with the ability to differentiate between real and ideal gases. Also, they will be in a position to explain why only real gases show Joule-Thomson effect and why only real gases can be liquified.

3. Apply the concepts of gas equations, pH and electrolyte while studying other chemistry courses.

4. 'Organometallic chemistry', students should be able to realize the potential applications of these compounds in the synthesis of various chemicals and polymers of day today use both at laboratory level in micro scale and industrially in macro scale.

Semester-II Course Code:3-2-106 organic&General Chemistry

1. Understand and explain the differential behaviour of organic compounds based on fundamental concepts learnt. After learning 'Structural theory in organic chemistry', students are expected to be well versed with all the fundamental concepts of organic chemistry such as bond fission, inductive effect, mesomeric effect, hyper conjugation etc.
2. Formulate the mechanism of organic reactions by recalling and correlating the fundamental properties of the reactants involved.
3. Learn and identify many organic reaction mechanisms including Free radical substitution, Electrophilic Addition and Electrophilic Aromatic substitution. Understand the concept of 'Benzene and its reactivity', students are to be in a position to apply the concept of resonance in explaining different phenomena such as acidity, basicity of acids, phenols and amines. Also, they are expected to be in a position to explain the preference of electrophilic and nucleophilic substitutions for ortho, para or meta positions.
4. Correlate and describe the stereo chemical properties of organic compounds and reactions.
5. Students must have developed the skills related to practicals such as safe handling of chemicals and the apparatus, recording the observations, drawing diagrams and graphs.

Semester-III Course Code:3-3-106 ORGANIC CHEMISTRY &SPECTROSCOPY

1. Understand preparation, properties and reactions of haloalkanes, haloarenes and oxygen containing functional groups.

2. To do functional group transformations by the use of synthetic chemistry learnt in this course.

3. To propose plausible mechanisms for any relevant reaction.

4. Name the carboxylic acids according to IUPAC, describe the acidity, write the methods of preparation and reactivity.

5. Able to describes the importance of carbanion in the organic synthesis, write the synthetic applications of malonic ester and acetoacetic ester.

Semester-IV Course Code:3-4-106 (INORGANIC,ORGANIC & PHYSICAL CHEMISTRY)

1. Understand the types of organo metallic compounds, concept of hapticity, study stability of organo metallic compounds by the counting of valence electrons surrounded by metal and bonding between metal and carbon monoxide.
2. Learnt about structures of bio molecules Glucose, fructose, Amino acids and Proteins and also synthetic transformations.
3. Propose different mechanism involved in nitro compounds and Amines. Understand the dye formation.
4. To learnt about the laws of absorption of light energy and the subsequent photochemical reactions, its mechanisms and Quantum efficiency.
5. Understand the laws of thermodynamics and different thermodynamic processes.
6. To learnt about coordination compounds, theories of bonding in coordination chemistry, different geometries, strengths of different ligands, also their mechanisms and stability of metal complexes.
7. Understand the role of metals in biological process and role of Haemoglobin and Myoglobin.
8. To learnt the phases of system, phase diagram and freezing mixture.
9. Understand the different types of conductance, theories of electrolytes, conductometric titrations, electrochemical cells and Determination of EMF of a cell.
10. Understand the concepts of reaction rates, factors affecting the reaction rate, identify the order of the reaction and theories of reaction rates.

Semester-V: Course Code: 3-5-107 Chemistry Paper V : (INORGANIC, ORGANIC & PHYSICAL CHEMISTRY)

1. Students able to learn the bonding in the coordinate compounds, stability, colour and magnetic properties, Learn the CFSE calculations, Isomerism in complex compounds
2. Able to know the colour phenomenon and calculation of magnetic moment.
3. Able to know the stability and reactivity of the complexes, labile and inert complexes, Methods for determination of composition of the complexes
4. Students understand the nomenclature of amines, Basicity of amines, comparison of basicity, separation of amines. Chemical properties of amines Able to learn the different types of thermodynamic systems, reaction energies, feasibility of the chemical reactions, entropy and its significance.

Semester-VI: Course Code: 3-6-105 Chemistry Elective Paper – VII-(A)- Analytical Methods In Chemistry

1. Student could able to learn and acquired skill on different titrations for quantitative determinations.
2. Acquire skill on choice of indicators in titrations.

3. Learn Chemical calculations in gravimetric and volumetric analysis.
4. Could able to process the analytical data.
5. Could learn how to minimise errors in chemical experiments.
6. Could aware on the Batch extraction, continuous extraction and counter current extraction and their applications.
7. Student could able to know the basics of chromatographic techniques and their applications.
8. Student could able acquire some basic knowledge of Chromatographic techniques and its applications

