VIDYABHARTI SANSTHA, WARDHA.
DR. R. G. BHOYAR ARTS, COMMERCE & SCIENCE COLLEGE
MOHANAPUR, TH-SELOO DIST-WARDHA 442104
(FORMERLY VIDYABHARTI COLLEGE)
Affiliated To Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur.
NAAC Accredited with B+ Grade
College Index : (Sr.-699) (Jr.07.08.006)

PROGRAM OUTCOME FOR B. SC. CHEMISTRY

Program Outcomes	**PO1:** The Programme enables the students to understand basic facts and concepts in Chemistry. **PO2:** To develop the ability to apply the principles of Chemistry, to develop problem solving skills, to become familiar with the emerging areas of Chemistry and their applications in various spheres of Chemical sciences and to apprise the students of its relevance in future studies. **PO3:** Students know about importance of Qualitative and Quantitative analysis used for different samples like soil samples, alloys estimation, water analysis. New technological world using nanomaterials, properties of nano materials magnetic properties of materials. **PO4:** Thermodynamic and Thermochemistry useful in our daily life and related with our surrounding atmosphere. **PO5:** Nuclear Magnetic resonance spectroscopy allows the molecular structure of a material to be analyzed by observing the measuring the interaction of nuclear spins when placed in a powerful magnetic field and extensively used in medicine in the form of magnetic resonance imaging and for analysis of chemicals. **PO6:** Bioinorganic chemistry provides knowledge about significant role of metal ions in biological system which is required for the maintenance of life. **PO7:** Student can describe the process It also develops skills in the proper handling of apparatus and chemicals and also gets exposure to the different processes used in industries and their applications. **PO8:** Use modern techniques used in analysis of materials and handling of the new equipment during the practical. **PO9:** To inculcates the scientific temperament in the studentsduring the experiments and how to corelate with outside the scientific community.

PROGRAM SPECIFIC OUTCOMES FOR B. SC. CHEMISTRY

Program Specific Outcomes	**PSO1:** The B.Sc. programme enabled the students to enhance their critical thinking, during the three years period of study and the curriculum motivates the mental thoughts and suppositions of the students. This helps the students to take up practical work and compare the results with their assumptions, there by leading to accuracy and validity of the practical knowledge. This Analysis leads to take decisions at intellectual, directorial and personal from different perspectives of life. **PSO2:** Understand the basic principles and concepts underlying the inorganic, organic and physical chemistry. **PSO3:** Comprehend the applications of chemistry in various walks of life. **PSO4:** Students gained functional knowledges of the fundamental theoretical concepts and experimental methods of Chemistry. **PSO5:** The students will be benefited to equip themselves to job requirements in the quality control, analytical laboratory or production wing of any Chemical or Pharmaceutical industry. **PSO6:** Able to use instrumental methods of chemical analyses. Students acquire fundamental Botanical knowledge through theory and practical.

Course Outcomes B. Sc. Chemistry

B. Sc. Semester-I

PAPER-I: INORGANIC CHEMISTRY	**CO1:** Basic knowledge of atomic structure, inorganic fundamental of a periodic property. **CO2:** Conceptualization of Valence bond theory (VBT) and Molecular Orbital theory (MOT), and VSPER theory. **CO3:** Differentiation in ionic and metallic bond, and S-block elements. **CO4:** A study of P-block elements, oxyacids of Sulphur, hydride of Phosphorus, and noble gases. **CO5:** Food adulteration process and detection, test fordetection physical adulteration and chemical adulteration and how to identify the food adulterant which are used various food products
PAPER-II: PHYSICAL CHEMISTRY	**CO1:** Basic knowledge of thermodynamics and calculations of problems related to Thermo-chemistry. **CO2:** Difference between Ideal gas and Real gas and their related equation. **CO3:** Understanding of Liquid State with emphasis onproperties of liquid. **CO4:** Concept of adsorption isotherm and principles of catalysis. **CO5:** Types of colloidal, electrophoresis and electro-osmosis, emulsion and gels

B. Sc. Semester-II

PAPER-I: ORGANIC CHEMISTRY	**CO1:** Understand the concept structure, bonding in organic compounds and different types of reaction mechanisms. **CO2:** Understand the concept of stereochemistry in detail. **CO3:** Understand the nomenclature, synthesis, chemical and physical properties of alkanes, cycloalkanes and alkenes **CO4:** Understand the nomenclature, synthesis, chemical and physical properties of dienes, alkynes and also the concept of aromaticity of organic compounds. **CO5:** Fuels and its calorific values properties and uses application of lubricants in industries

PAPER-II: PHYSICAL CHEMISTRY	**CO1:** CO1: Second law of thermodynamics and free energy work functions. **CO2:** CO2: Understanding of Phase rule and liquid-liquid mixture. **CO3:** Insight into Nuclear Chemistry and Molecular Structure. **CO4:** laws of Chemical kinetics. **CO5:** Types of pollutions and its control measures, types of pollutants, adsorption techniques.

B. Sc. Semester-III

PAPER-I: INORGANIC CHEMISTRY	**CO1:** Diagrammatic representation of molecules according to MOT, and properties of interhalogen compounds **CO2:** Chemistry of first transition elements and non-aqueous solvents **CO3:** Comparative study of the second and third transition series and error in chemical analysis **CO4:** Chemistry of lanthanides and actinides, and lanthanide contraction
PAPER-II: ORGANIC CHEMISTRY	**CO1:** Understand nomenclature, synthesis, chemical propertiesof alkanes in aryl, alkyl halides. **CO2:** Understand nomenclature, synthesis, chemical propertiesof dihydric, trihydric alcohols and phenols in detail **CO3:** Understand nomenclature, synthesis, chemical propertiesof aldehydes and ketones and mechanisms of nucleophilic addition **CO4:** Understand nomenclature, synthesis, chemical properties of carboxylic acids and their derivatives along with reactive mechanisms.

B. Sc. Semester-IV

PAPER-I: INORGANIC CHEMISTRY	**CO1:** A detail study of coordination compounds and its applications. **CO2:** Isomerism and redox process in inorganic compounds. **CO3:** The concept organometallic and metal carbonyl compounds. **CO4:** Applications of inorganic macromolecules in thebiological concept, and acid-bases principles.

PAPER-II: PHYSICAL CHEMISTRY	**CO1:** Insight into laws of crystallography and Bravais lattices **CO2:** Debye-Huckel theory and concepts related to electrochemistry **CO3:** Introduction to Rotational and Vibration Spectroscopy. **CO4:** Basics of Quantum Chemistry, Operators andSchrodinger wave function

B. Sc. Semester-V

PAPER-I: ORGANIC CHEMISTRY	**CO1:** The students will understand some fundamental aspects of organic chemistry. They will learn mechanism of some organic reactions, classification of polymers, structure and uses of some commercial and natural polymers. **CO2:** To know stereochemistry and various possible conformations of organic compounds and how it affects the reaction outcome. **CO3:** To be familiarize with the important photochemical reactions in Organic Chemistry. **CO4:** To understand the functions and applications of bioorganic compounds.
PAPER-II: PHYSICAL CHEMISTRY	**CO1:** To study the basic postulates of quantum mechanics. **CO2:** To enable the students to solve the simple quantum mechanical models such as simple harmonic oscillator, particle in a 1D- box, rigid rotor, H atom etc. **CO2:** To understand the quantum mechanical aspect of angular momentum and spin. **CO3:** Enable the students to predict the point group of important molecules and to know how they are classified **CO4:** To understand the idea of space groups and to learn the theory of molecular symmetry. **CO5:** To gain skill to apply group theory to vibrational and electronic spectroscopy.

B. Sc. Semester-VI

PAPER-I: INORGANIC CHEMISTRY	**CO1:** To know the structure and bonding of important coordination compounds. **CO2:** To understand the magnetic properties of complexes and to know how magnetic moments can be employed for the interpretation of their structure **CO3:** To get an overview about the stereochemistry of coordination compounds **CO4:** To get an idea about the basic coordination chemistry of Lanthanides and Actinides. **CO5:** Ability to prepare inorganic complexes. Ability to prepare inorganic complexes. **CO6:** To know about VBT, CFT and MOT of co-ordination complexes

PAPER-II: ORGANIC CHEMISTRY	**CO1:** To impart the students a thorough knowledge about the mechanisms of reactions of some selected functional groups in organic compounds **CO2:** To give an outline of applied organic chemistry and the applications of organic chemistry in various spheres of chemical sciences. **CO3:** To give an elementary idea of chemotherapy, organic spectroscopy and photochemistry. **CO4:** To analyze organic compound using UV, IR and NMR spectroscopic techniques, which provides platform for students to work in industries.