Vidya Vikas Madal Pathrud's

SHANKARRAO PATIL MAHAVIDYLAYA, BHOOM.

Department of Chemistry

Course Outcome

First Year

Paper I Inorganic Chemistry	
CO 1	To understand some periodic properties - atomic and ionic radii, ionization energy, electron affinity and electro negativity with reference to trends in periodic table and application in predicting chemical behavior.
CO 2	Periodic table and its trends as well as applications.
CO 3	To study the basics of atomic structure - Atomic orbitals, Quantum numbers, Heisenberg uncertainty, Aufbau and Pauli exclusion principles, Hund's multiplicity rule. Electronic configurations of the elements, Bohr's atomic model.
CO 4	Getting familiar about elements their structure and properties.
CO 5	Compound forming abilities of element from S & P Block element.

Paper No. II Organic Chemistry	
CO 1	To understand the basic concepts in organic chemistry- reactions, reagents and mechanisms of organic reactions.
CO 2	Isomerism, Optical activities, configuration and nomenclature of Geometric isomers.
CO 3	Types of Hydrocarbons (Alkanes, Alkenes, Arenes, Alkyl & Aryl Halides) their properties and Chemical reactions.
CO 4	To study stereochemistry and its importance.
CO 5	To know stereochemistry and various possible conformations of organic compounds and how it affects the reaction outcome.

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Paper-III Lab Course	
CO 1	Preparation of solution of different Normality and their Standardization.
CO 2	Getting familiar about different Physical instruments (Eudiometer, Viscometer, Staglanometer, Calorimeter, and Spectrophotometer) and their applications.
CO 3	Separation of Acid & Bases from Binary Mixtures.
CO 4	To develop skills required for the qualitative analysis of organic compounds, determination of physical constants.
CO 5	To impart the students a thorough knowledge of Systematic qualitative analysis of mixtures containing two acid and two basic radicals

Paper IV Physical Chemistry	
CO 1	Uses and Application of mathematical Concepts in Chemistry.
CO 2	States of Compounds their further Classification, Different Laws (Boyles, Charles, Grahams)
CO 3	Rate of reactions, Factors influencing Rate of reactions and Characteristics of reactions.
CO 4	Uses and Application of mathematical Concepts in Chemistry.
CO 5	This course gives the student idea about the nature and purity of the crystal.

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Paper V Inorganic Chemistry - II	
CO 1	To understand chemical properties of the noble gases, chemistry of xenon, structure and bonding in xenon compounds.
CO 2	To understand types of bonds- ionic, covalent and coordinate, Hydrogen bonding, Van-der-Waals forces, Metallic bond Theories of bonding - VBT, VSEPR, MOT with formation and shapes of molecules.
CO 3	To understand the basics of nuclear chemistry - Isotopes, Isobars mass, Binding Energy, Packing fraction N/Z ratio, Radio activity, properties of fundamental particles, Artificial transmutation. Applications with respect to trans-uranic elements, carbon dating.
CO 4	Radioactive elements & Radioactivity, Properties of Alpha, Beta & Gama rays, Carbon Dating
CO 5	To study theory of volumetric analysis - Types of titrations, volumetric apparatus, calibration of pipette and burette, indicators used in pH - titrations, oxidizing agents used in titrations. Theory of internal, external and self-indicators for redox titration.

Paper-VI Lab Course-II (Organic Qualitative Analysis & Organic Estimation)	
CO 1	Identification of Nature/ Functional group/ element/ Derivative/Physical constant Of different Organic compounds.
CO 2	Estimation of Organic compounds like Phenol, oxalic & Acetic Acid.
CO 3	Students will gain an understanding of methods of analysis related to chemical analysis goals such as detection of elements.
CO 4	To develop skills required for the qualitative analysis of organic compounds, determination of physical constants.
CO 5	To impart the students a thorough knowledge of Systematic qualitative analysis of mixtures containing two acid and two basic radicals.

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Course Outcome

Second Year

Paper-VII Organic Chemistry	
CO 1	Study of Alchol & Phenols their Physical and Chemical Properties including Different chemical reactions.
CO 2	Study of compounds containing functional groups Aldehyde, ketones, Carb. Acids with their physical and chemical properties.
CO 3	Nitrogen containing compounds their acidity and basicity along with different chemical reactions.
CO 4	The students will understand some fundamental aspects of organic chemistry. They will learn mechanism of some organic reactions.
CO 5	To acquaint knowledge on Aromaticity and coordination chemistry

Paper-VIII Physical Chemistry	
CO 1	Formulate the first law of thermodynamics for a closed systems and arrange the change in energy in the closed systems via heat and work transfer
CO 2	Apply the first law of Know the statistical thermodynamics and various partition functions Know the statistical thermodynamics and various partition functions.
CO 3	Thermodynamics to the open systems. assess thermodynamic applications using second law of thermodynamics , assess thermodynamic applications using second law of thermodynamics.
CO 4	Define chemical equilibrium. Calculate the equilibrium constant from concentration data Define and discuss Le Chateler's Principle and Solve a variety of chemical equilibrium problems.
CO 5	To provide an insight into the characteristics of different types of solutions and electrochemical phenomena.

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Paper-IX Lab Course-III (Physical Chemistry & Inorganic Chemistry)	
CO 1	Study the kinetics of reactions.
CO 2	Gravimetric Estimation of different in-organic Compounds.(Ni-DMG, Ba Chromate etc).
CO 3	Complexometric titrations to Estimate Different metals by using EDTA Solution and Indicators.
CO 4	To enable the students to know about principles and applications of Analytical techniques,

Paper-X Inorganic Chemistry	
CO 1	Study of Transition elements and their Coordination Compounds Forming abilities including Eighteen electron rule, their stabilities.
CO 2	Study of Lanthanides & Actinides their properties, occurrence and their trends w.r.t Periodic Table.
CO 3	Basics of Acids & Bases their different Definitions by different theories, different Solvent systems especially detail study of Non Aqueous Solvents.
CO 4	To understand the magnetic properties of complexes and to know how magnetic moments can be employed for the interpretation of their structure
CO 5	To learn the concepts of acids and bases, pH and buffer solutions.

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Paper-XI Physical Chemistry-II	
CO 1	State the thermodynamic criterion for equilibrium in terms of chemical potential, Interpret the slope of phase boundaries on a pressure-temperature phase diagram in terms of the relevant changes in entropy and molar volume for the given phase change.
CO 2	Interpret phase diagrams for binary mixtures, identifying the phases and components present in each region. Perform calculations using Raoult's Law and Henry's Law to relate vapor pressure to composition in the liquid phase
CO 3	Explain the chemistry of conductance and its variation with dilution, migration of ions in solutions and applications of conductance measurement.
CO 4	Understand different types of galvanic cells, their Nernst equations, and measurement of emf, calculations of thermodynamic properties and other parameters from the emf measurements.
CO 5	Electrochemistry discussed electrical properties of ionic solutions. Different applications are there of this course.

Paper-XII Lab Course-IV (Physical Chemistry & Organic Chemistry)	
CO 1	Determination of Normality of solution Conductometrically & pH metrically.
CO 2	Study and determination of Refractive Index of System Also indicator Constant of indicator colorimetrically.
CO 3	Study and Verification of Lambert-Beers Law.
CO 4	Evaluation of Analytical data, Statistical texts and data, Theory of Quantitative Analysis, Gravimetric methods
CO 5	Enable the students to estimate the binary mixtures of metallic ions by volumetric and gravimetric methods

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Course Outcome

Third Year

Paper-XIII Physical Chemistry	
CO 1	Make student familiar about Compton effect, De Broglie Hypothesis, Heisenberg's uncertainty principles, Schrodinger wave equation.
CO 2	To elaborate region of spectrum and study spectrum of diatomic molecules, selection rule, application of spectroscopy for determination of bond length and solving different numerical.
CO 3	Photochemistry and its law such as Grothus-Drapper law, Stark-Einstein law.
CO 4	Study and difference between Fluorescence and Phosphorescence, and study photosensitized reactions.
CO 5	To impart a thorough knowledge of the fundamentals of microwave, infra red, Raman, electronic and magnetic resonance spectroscopy.

Paper-XIV Organic Chemistry	
CO 1	Basics of spectroscopy and calculating chemical shift values and their variation with respect to shielding and de shielding effects.
CO 2	Organometallic Compounds and their reactions.
CO 3	Study the structure and stability of Enolates and synthetic applications of Enolates to different Chemical reactions.
CO 4	Study of Fat, Oil, Detergents their preparation and extraction.
CO 5	This course gives a detail knowledge to the student about the analysis of statistical data they got through from different chemical experiment

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Paper-XV Lab Course-V (Organic Chemistry & Inorganic Chemistry)	
CO 1	Separation and identification of Components from Binary mixture.
CO 2	Separation of metals from binary mixture and their Estimation by both Volumetrically and gravimetrically.
CO 3	Find out amount of Cl in Bleaching powder.
CO 4	Separation and identification of Components from Binary mixture.
CO 5	Students will gain an understanding of methods of analysis related to chemical analysis such as detection of function groups.

Paper-XVI Inorganic Chemistry	
CO 1	Detail study of valance bond theory and crystal field theory.
CO 2	Electronic spectra of transition metal complexes to study d-d transition electronic transition and Orgel diagram.
CO 3	Elements in biological processes and their role in biological and environment processes.
CO 4	Chromatography their types and applications.
CO 5	To understand the functions and applications of bioorganic compounds, valence bond and molecular orbital theory

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Paper-XVII Organic Chemistry	
CO 1	Heterocyclic Compounds their basicity, stability, preparation methods and different chemical reactions.
CO 2	Study the carbohydrates their classification as monosaccharides & Disaccharides and Polysaccharides.
CO 3	Study of Synthetic Polymer, Dyes & Drugs their definition, classification, Synthesis and application.
CO 4	To enable the students to learn about carbohydrates, amino acids and hetero cyclic compounds.
CO 5	To understand the importance of carbohydrate, amino acids in chemistry.

Paper-XVIII Lab Course-VI (Organic Chemistry & Physical Chemistry)	
CO 1	To introduce and teach the estimation of vitamin c from commercial drinks.
CO 2	Estimation of Saponification value of Oils.
CO 3	Preparation of different organic compounds and check their purity by thin layer Chromatography.
CO 4	The students will develop basic skills in the techniques of crystallization, distillation, TLC.
CO 5	To learn the separation and purification of an organic mixture by chemical/solvent separation methods, Enable the students to prepare organic compounds

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Programme Outcomes

Programme Outcomes	
PO 1	To provide a broad foundation in chemistry.
PO 2	To expose the students to a breadth of experimental techniques using available resources. The student will understand the importance of the Periodic Table, how it came to be, and its role in organizing chemical information.
PO 3	The student will learn the laboratory skills needed to design, safely conduct and interpret chemical research.
PO 4	Students be able to appreciate the applications of chemistry in day to day life and explore new areas of Chemistry and Allied fields of Science and technology.
PO 5	Knowledge of for safe handling of chemicals in chemical laboratory.
PO 6	Helps in understanding the causes of environmental pollution and can open up new methods for environmental pollution control.
PO 7	Acquires the ability to synthesize, separate and characterize compounds using laboratory and instrumentation techniques.
PO 8	Employ critical thinking and the scientific knowledge to design, carry out, record and analyze the results of chemical reactions.
PO 9	To be familiarized 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.
PO 10	To be exposed to the different processes used in industries and their applications..
PO 11	Students will be able to access the primary literature, identify relevant works for a particular topic, and evaluate the scientific content of these works
PO 12	Synthesize complex information appropriate to the discipline

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Programme Specific Outcomes

Programme Specific Outcomes	
PSO 1	The students will learn the important analytical and instrumental tools used for practicing chemistry .
PSO 2	To develop skills for quantitative estimation using the different branches of volumetric Analysis.
PSO 3	To have exposure to various emerging new areas of organic chemistry.

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