

Department of Chemistry
S. K. Porwal College of Arts, Science and Commerce,
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Programme Specific Outcome of M.Sc. in Chemistry

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Programme Specific Outcome of M.Sc. Chemistry

PSO1: The M.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, organizational and personal from different perspectives of life.

PSO 2: Understand theoretical concepts of instruments that are commonly used in most chemistry fields as well as interpret and use data generated in instrumental for chemical analyses.

PSO 3: Provide opportunities to excel in academics, research or Industry.

PSO 4: Develop an understanding of eco-friendly chemical processes and impact of chemistry on health and environment.

PSO 5: Eligibility towards research / employment

PSO6: 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.

Course Outcome Semester I

Course	Outcomes
Paper – I (Code: 1T1) Inorganic Chemistry	CO1: To study VSEPR theory, stereo chemical rules and crystal field theory of transition metal complexes. CO2: Understand the formation and stability constant of the complexes, and its methods, to learn spectrophotometric methods to determine unknown concentration of metal ion (Jobs method) CO3: Introduction of boron hydride and its detailed chemistry. CO4: Student will learn the classification of metal clusters and its bonding
Paper II (Code: 1T2) Organic Chemistry	CO1: Acquire the knowledge of Nature and Bonding in Organic Molecule as well as Reactive Intermediates CO2: Illustrate stereochemistry of organometallic compounds CO3: Understand thermodynamics and Reaction mechanism of Aliphatic nucleophilic substitution CO4: Understand thermodynamics and Reaction mechanism of Aromatic Nucleophilic Substitution and Aromatic electrophilic substitution and Effect of Structure on reactivity
Paper III (Code: 1T3) Physical Chemistry	CO1: Review of Laws of thermodynamics including Caratheodry's principal and Kelvin Plank Statements. CO2: Partial molar quantities with quantitative relation application in Gibbs Phase rule. CO3: Different adsorption isotherms and their applications, idea about macromolecules.

	CO4: Different laws of Chemical Kinetics, Bodeinstein steady state approximation and its applications.
Paper IV (Code: 1T4) Analytical Chemistry	CO1: Acquire sound theoretical knowledge and understanding of the fundamental concepts, principles and processes in Analytical Chemistry and statistical analysis. CO2: Understand the underlying assumptions of the most common chromatographic, solvent extraction separation techniques and approaches to method validation. CO3: Understand various classical quantitative methods of analysis like Gravimetric analysis , Volumetric methods of analysis CO4: Acquire basic knowledge of some electrochemical analytical techniques

Course Outcome Semester II

Course	Outcomes
Paper V (Code: 2T1) Inorganic Chemistry	CO1: To study the electronic spectra and magnetic properties of transition metal complexes. CO2: To detailed study of reaction mechanism involved in transition metal complexes. CO3: To study the synthesis of metal carbonyls and metal nitrosyls, and their structural elucidation using spectroscopic technique. CO4:To study the principal of ESR, RAMAN, Massbauer spectroscopy and their application in various field.
Paper VI (Code: 2T2) Organic Chemistry	CO1: Study reaction mechanisms for addition to carbon-carbon multiple bond and addition to carbon-hetero atom multiple bond. CO2: Understand mechanism for molecular rearrangement and elimination reactions. CO3: To gain knowledge of free radical reactions. CO4: To study and understand importance of green chemistry
Paper VII (Code: 2T3)	CO1: Introduction of Quantum Mechanics, application of Schrödinger Wave Equation to Simple Systems including 3-Dimensional Box,

Physical Chemistry	Rigid Rotor, TheHydrogen Atom CO2: Concept of fugacity, determination of fugacity, notions of Nonequilibrium Thermodynamics. CO3: Introduction to crystals, Unit Cell and lattice parameters, Symmetry elements in crystals, concepts of Crystal Defects. CO4: Concepts of molecular distribution, details of Nuclear Chemistry.
Paper VIII (Code: 2T4) Analytical Chemistry	CO1: Get the concept of Sampling and quantification CO2:Understand Modern chromatographic separation techniques in detail CO3:Know the theoretical principles of spectrometric or spectrophotometric optical methods. CO4: Understand detail concepts of electroanalytical techniques like Polarography, Amperometric titrations

Course Outcome Semester III

Course	Outcomes
ORGANIC CHEMISTRY SPECIALIZATION Paper IX (Code: 3T1) Special I-Organic Chemistry	CO1: To study Photochemistry in organic compounds. Understand oxidation and reduction methods in chemical methods. CO2: To study pericyclic reactions of organic compounds. CO3: Understand oxidation and reduction methods in chemical methods. CO4: Gain the knowledge about chemistry of P, S, Si, and Boron compounds and use of Organo silicon compounds in organic synthesis.
Paper X (Code: 3T2) Special II-Organic Chemistry	CO1: Understand chemistry of Terpenoids and Porphyrins natural products. CO2: know the importance of alkaloids and prostaglandins in biological systems. CO3: To gain the knowledge about Steroids and plant pigments CO4: To gain the knowledge about carbohydrate, amino acids, protein and peptides.
Paper XI Elective	CO1: Understand the basics about drug design.

(Code: 3T3) Medicinal Chemistry	CO2: Study about pharmacokinetics and pharmacodynamics of drugs, Diuretics Analgesics and Antipyretics. CO3: Gain the knowledge about the cardiovascular drugs, antineoplastic agents CO4: Get knowledge about Psychoactive drugs, Coagulant and Anticoagulants.
Paper XII(Code: 3T4) Core Subject Centric - I: Spectroscopy– I	CO1: Idea of symmetry of molecules and group theory, Great Orthogonality Theorem. CO2: Details of mass spectroscopy and its applications, experimental techniques, and application of Mössbauer spectroscopy. CO3: Introduction to Microwave spectroscopy application in deriving: molecular structure, dipole moment, atomic mass, ESR spectroscopy: Introduction, principle and application. CO4: P,Q,R branches in Infrared spectroscopy, Structure determination of organic molecules by IR spectroscopy, Raman Spectroscopy, Rayleigh scattering and Raman Scattering.

Course Outcome Semester IV

Course	Outcomes
Paper XIII(Code: 4T1) Special I-Organic Chemistry	CO1: Study carbanion , organometallic reagents in organic chemistry. CO2: Understand use of organometallic reagents in organic chemistry. CO3: Know about advanced stereochemistry and Protection, Deprotection of functional groups in organic compounds CO4: Study retrosynthetic analysis of organic compound
Paper XIV(Code: 4T2) Special II-Organic Chemistry	CO1: Study enzyme chemistry, mechanism of enzymatic reaction. CO2: Understand different heterocyclic compounds, their preparation and reactions CO3: Understand concepts of nucleic acids and lipids CO4: Acquire the knowledge about different dyes, Pharmaceutical and polymer chemistry
Paper XV (Code:	CO1: Overview of Intellectual property right, Statistical method: For

4T3) Elective- Medicinal Chemistry	sampling. CO2: Anti-Viral agents, Anti-malarial agents and Local Anti-infective drug mode of action and synthesis of different drugs. CO3: Synthesis and mode of action of Histamines. Antihistamic agents and Antibiotics drugs. CO4: Synthesis and mode of action of Anthelminitics and antiamoebic drugs and Anti-inflammatory drugs.
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Paper XVI(Code: 4T4) Core Subject Centric -II Spectroscopy – II	CO1: Ultraviolet and visible spectroscopy, Frank-Condon principle, various electronic transitions, basic principles of Photoelectron spectroscopy. CO2: Nuclear magnetic Resonance Spectroscopy principles and its application in Structure determination of organic molecules. CO3: Two-dimensional NMR spectroscopy-COSY, HETCOR, NOSEY, DEPT, INEPT, APT, INADEQUATE techniques. CO4: Introduction and applications of Diffraction techniques, X ray diffraction, Electron diffraction, Neutron diffraction.
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