Vidyasagar University

Midnapore-721102, West Bengal

POs & PSOs for the Post-Graduate Programme in CHEMISTRY AND CHEMICAL TECHNOLOGY

National Educational Policy – 2020

[w.e.f. 2025-26]

Department of Chemistry 25-26

Program Outcomes (POs)

On successful completion of the M. Sc in Chemistry program, the students will be able to learn the following topics	
PO1	Advanced Knowledge and Understanding: Comprehensive understanding of advanced concepts in Physical, Inorganic, and Organic Chemistry, including spectroscopy, thermodynamics, kinetics, and quantum chemistry, is expected to be demonstrated by the learners.
PO2	Application of Chemical Principles: Chemical theories, models, and experimental techniques are expected to be applied for the analysis, interpretation, and resolution of real-world chemical problems in academic, industrial, and research settings.
PO3	Laboratory and Instrumental Competence: Practical skills in chemical synthesis, qualitative and quantitative analysis, and the use of modern instrumental techniques such as NMR, IR, UV–Vis, and Mass spectroscopy are to be acquired and demonstrated.
PO4	Research and Innovation Skills: The ability to design and execute independent research projects, analyze data critically, and contribute to innovative solutio ns in emerging areas of chemical sciences is to be developed.
PO5	Interdisciplinary Integration: Knowledge from allied fields such as nanotechnology, pharmaceutical chemistry, food processing, and computer applications is to be integrated for addressing multidisciplinary scientific challenges.
PO6	Scientific Communication and Documentation: Proficiency in communicating scientific information effectively through oral presentations, reports, and publications is expected to be achieved.
PO7	Ethical and Environmental Awareness: Professional ethics, laboratory safety, and environmental sustainability are to be practiced and promoted in all chemical activities and research endeavors.
PO8	Computational and Analytical Skills: Computational tools, data analysis methods, and statistical techniques are to be employed for the interpretation of chemical phenomena and validation of experimental results.
PO9	Lifelong Learning and Professional Development: The importance of continuous learning for staying updated with new developments in chemistry and related sciences is to be recognized and adopted as a professional habit.
PO10	Teamwork and Leadership: The ability to work collaboratively in multidisciplinary teams and to demonstrate leadership and responsibility in professional and research environments is expected to be cultivated.

Programme Specific Outcomes (PSOs)

After the successful completion of M. Sc. in Chemistry program, the students are expected to:	
PSO1	Acquire specialized knowledge, practical competence, and research-oriented skills in their chosen branch of chemistry — Physical, Inorganic, or Organic Chemistry. Each specialization aims to develop analytical thinking, experimental expertise, and interdisciplinary understanding aligned with modern scientific and industrial needs.
PSO2	Learners are equipped with in-depth understanding of quantum mechanics, thermodynamics, kinetics, and spectroscopy to interpret physical and molecular behavior. Emphasis is placed on mastering experimental and computational techniques, simulation, and modeling of chemical systems. The specialization prepares students to apply theoretical and experimental principles in materials science, nanotechnology, and pharmaceutical research.
PSO3	Students gain mastery in reaction mechanisms, stereochemistry, pericyclic reactions, and etrosynthetic analysis. The program enhances skills in designing multi-step organic syntheses using green and sustainable chemistry approaches. Emphasis is given to spectroscopic and hromatographic techniques for molecular characterization, and to understanding the ignificance of organic chemistry in pharmaceuticals, food science, and biological systems.
PSO4	Gain advanced knowledge of coordination chemistry, organometallics, bioinorganic systems, and solid-state chemistry. Learners are trained in group theory applications, synthesis of transition metal complexes, and analysis of reaction mechanisms. It nurtures understanding of inorganic chemistry's role in catalysis, materials science, and environmental chemistry, enhancing both theoretical insight and laboratory competence.
PSO5	The learners will be acquainted with the historical and cultural development of chemistry in the context of Indian knowledge system.