



**“Education for Knowledge, Science and Culture.”**  
 – Shikshanmaharshi Dr. Bapuji Salunkhe  
**Shri. Swami Vivekanand Shikshan Sanstha's**  
**VIVEKANAND COLLEGE, KOLHAPUR**  
**(EMPOWERED AUTONOMOUS)**



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## Department of Chemistry

### Course Outcomes (COs): Chemistry

M.Sc. Part II Inorganic Chemistry (NEP Introduced in the year 2024-25)	
Semester III	
DSC-V: Major Paper: Inorganic Chemical Spectroscopy (DSC15CHE31)	
CO No.	On completion of the course, student will be able to:
CO1	Interpret the symmetry elements and their operations as required to specify molecular symmetry and possible point groups from symmetry elements and be able to find point group of molecules by systemic procedure.
CO2	Explain the principle and instrumentation of infra-red (IR) and Raman spectroscopy and interpret infrared and Raman spectra for chemical analysis inorganic compounds.
CO3	Explain the principle and instrumentation of Mass spectroscopy and interpret Mass spectrum for chemical analysis of inorganic compounds.
CO4	Explain the principle and instrumentation of nuclear magnetic resonance (NMR) and X-ray photoelectron spectroscopy (XPS) and interpret the spectrum for chemical analysis of inorganic compounds.
DSC-VI: Major Paper: Co-ordination Chemistry-I (DSC15CHE32)	
CO No.	On completion of the course, student will be able to:
CO1	Know the fundamentals in photochemistry, to explain different types of photochemical reactions and photochemistry of coordination compounds.
CO2	Understand Orgel diagrams and explain electronic spectra of transition metal complexes.
CO3	Understand magnetic properties of complexes and explain with respect to spin orbit coupling.
CO4	Understand and explain mixed ligand complexes and use of transition metal complexes in catalysis.
DSE - IX: Elective Paper I: Material Science (DSE15CHE31)	

	environment and behaviour and to interpret structure.
<b>DSC-VIII: Major Paper: Co-ordination Chemistry-II (DSC15CHE42)</b>	
<b>CO No.</b>	<b>On completion of the course, student will be able to:</b>
CO1	Explain lability and inertness of complexes and with respect to VBT and CFT.
CO2	Explain the kinetics and mechanism of substitution and electron transfer reactions in octahedral and square planar complexes.
CO3	Explain methods of properties, preparation, stability and applications of organometallic compounds in organic synthesis.
CO4	Interpret structure and bonding transition metal pi-complexes and their applications in organic synthesis relating to nucleophilic and electrophilic attack on ligands.
<b>DSE - XI: Elective Paper I: Inorganic Nanomaterials (DSE15CHE41)</b>	
<b>CO No.</b>	<b>On completion of the course, student will be able to:</b>
CO1	Understand synthesis approaches of nanomaterials and challenges in Nano Technology.
CO2	Describe different characterization techniques of materials, outline the principles on which they are based, and explain their limitations.
CO3	Understand the technological application of nanomaterial is usable in multiple sectors, from healthcare and mechanics to environmental preservation and air purification.
CO4	Acquire knowledge about the toxicity in Nanoscience, and their effects on Human as well as learn various concepts of toxicity, and its effects.
<b>DSE - XII: Elective Paper II: Energy and Environmental Chemistry (DSE15CHE42)</b>	
<b>CO No.</b>	<b>On completion of the course, student will be able to:</b>
CO1	Understand the basic building blocks of various forms of energy and to know applications of fuel cells in various sectors, hydrogen production, storage, handling and safety issues.
CO2	Understand energy storage systems and describe the parts in various Li-Ion Battery, materials and functionalities.
CO3	Explain the common principles, routes and processes in controlling the gaseous pollutants.
CO4	Understand meaning of important parameters for measuring water quality and understand the principles and the practical approaches and technique required to effectively monitor the chemical, hydrological and microbiological elements of water quality.



*S. Dixe*  
**HEAD**  
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