Estd. June 1964
"Education for Knowledge, Science and Culture."
– Shikshanmaharshi Dr. Bapuji Salunkhe
Shri. Swami Vivekanand Shikshan Sanstha's
VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)
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Department of Chemistry

Course Outcomes (COs): Chemistry

B. Sc. Part III Chemistry (Introduced in the year 2023-24)	
Semester V	
Physical Chemistry (DSE-1002 E1)	
CO No.	**On completion of the course, student will be able to:**
CO1	Learn and understand quantum Chemistry, Heisenberg's uncertainty principle, concept of energy operators (Hamiltonian), Schrodinger wave equation, physical interpretation of the ψ and ψ2 and particle in a one dimensional box.
CO2	Acquire knowledge about spectroscopy, Electromagnetic spectrum, Energy level diagram, Study of rotational spectra of diatomic molecules: Rigid rotor model, Microwave oven, vibrational spectra of diatomic molecules, simple Harmonic oscillator model, Raman spectra: Concept of polarizability, pure rotational and pure Vibrational Raman spectra of diatomic molecules.
CO3	Impart and understand photochemical laws, reactions and various photochemical phenomena.
CO4	Gain and understand the knowledge of emf measurements, types of electrodes, different types of cells, various applications of emf measurements.
Inorganic Chemistry (DSE-1002 E2)	
CO No.	**On completion of the course, student will be able to:**
CO1	Understand the role of acids and bases as well as all chemical properties of solutes in Chemistry.
CO2	Gain and understand the synthesis and applications of the semiconductors and superconductors in electrical and electronic devices. Also get a basic understanding of nanochemistry, nanotechnology and its fascinating aspects.

CO3	Improve the level of understanding of structure, method of preparation and applications of organometallic compounds in various fields.
CO4	Impart essential knowledge regarding classification, types, mechanism and applications of catalyst in industrial fields.
Organic Chemistry (DSE-1002 E3)	
CO1	Understand basic concepts of spectroscopy.
CO2	Acquire knowledge of various spectroscopic techniques such as UV, IR, NMR and Mass Spectroscopy.
CO3	Interpret molecular structural formula by using spectroscopic techniques.
CO4	Make the solutions and find the structures of unknown organic compounds on the basis of IR, NMR, UV and Mass spectroscopic data.
Analytical Chemistry (DSE-1002 E4)	
CO1	Acquire knowledge of theoretical and practical aspects of Soil, water and fertilizers analysis.
CO2	Adopt skills of various analytical techniques such as Flame photometry, potentiometry and colorimetry.
CO3	Learn various aspects to apply analytical techniques to analysed the samples.
CO4	Adopt the knowledge about basics and methodologies of various chromatography techniques.
SEC: Laboratory Safety Management	
CO1	Demonstrate a comprehensive understanding of laboratory safety principles and protocols, hazardous chemicals and routes of entry for toxins.
CO2	Learn about MSDS and Laboratory safety symbols.
CO3	Acquire the knowledge of Prevention of Accidents and First Aid Measures in the laboratory.
CO4	Understand the Safe Handling of Chemicals and waste management in the laboratory.
Semester VI	
Physical Chemistry (DSE-1002 F1)	
CO No.	**On completion of the course, student will be able to:**
CO1	Acquire knowledge about basic concept of adsorption, types of adsorption, Freundlich, Langmuir adsorption isotherm and BET

	equation.
CO2	Gainthe knowledge about basic concept of Thermodyanamics, free energy, Gibbs-Helmholtz equation and its applications, problem related with it.
CO3	Learn and understand Space lattice, lattice sites, Lattice planes, Unit cell, Laws of crystallography, Weiss indices and Miller indices, Cubic lattices and types of cubic lattice, planes or faces of a simple cubic system, Diffraction of X-rays, Derivation of Bragg's equation, Determination of crystal structure by Bragg's method, crystal structure of NaCl and KCl on the basis of Bragg's equation.
CO4	Understandthe kinetics, Simultaneous reactions such as i)opposing reaction ii)side reaction iii) consecutive reaction iv) chain reaction v) explosive reaction.
Inorganic Chemistry (DSE-1002 F2)	
CO No.	**On completion of the course, student will be able to:**
CO1	Acquire the important aspects of the mechanism of reactions involved in inorganic complexes of transition metals as well as thermodynamic and kinetic aspects of metal complexes.
CO2	Develop interest in various nuclear reactions and role of radio isotopes in medicinal, industrial and archaeology fields.
CO3	Impart essential knowledge regarding the characteristics, properties and separation of lanthanides and actinides, synthesis and IUPAC Nomenclature of transuranic elements (TU).
CO4	Improve the level of understanding of the techniques involved in ore dressing and extraction of cast iron from its ore.
Organic Chemistry (DSE-1002 F3)	
CO1	Learn the mechanism of different organic name reactions and to become confident to solve the problems based on the reactions.
CO2	Adopt the utility of reagents in organic synthesis.
CO3	Understand the fundamentals of terpenoids and alkaloids.
CO4	Illustrate the applications of nucleophilic substitution reactions of aromatic compounds.
	Acquire knowledge of pharmaceuticals and its use.
Industrial Chemistry (DSE-1002 F4)	
CO1	Understand the basics of industrial chemistry.
CO2	Learn the manufacturing processes of heavy chemicals and fertilizers.
CO3	Acquire knowledge of sugar and jaggery industry.

CO4	Gain and understand fermentation processes involved in manufacturing of alcohol.

Dr. (Mrs). S, D, Shirke
HEAD
DEPARTMENT OF CHEMISTRY
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(EMPOWERED AUTONOMOUS)