

Shikshan Prasarak Mandal's
Gopal Krishna Gokhale College, Kolhapur
Course Outcomes
Department of Chemistry

Class	Semester	Paper Name & Number	Outcomes
B.Sc.I CBCS	Sem.-I	DSC-3A- Inorganic Chemistry paper I	<ol style="list-style-type: none"> 1. The students will understand Bhor's Theory, Shape of orbital, three laws related to electron filling rules & Periodic trends. 2. The students will appreciate formation of ionic bond, Born-Haber cycle & Fajan's Rule. 3. The students will realize Concept of hybridization, different types of hybridization and geometry. 4. The students will understand type of overlapping, molecular orbital diagram and bond order.
		DSC-4A- Organic Chemistry paper II	<ol style="list-style-type: none"> 1. The students will be capable to discuss Fundamentals of organic reactions mechanisms. 2. The student will explain brief idea of types of chemical reactions and reactive intermediates. 3. The students will be able to discuss the concept of stereochemistry. 4. The students will be able to discuss the optically active or inactive compounds, E,Z & R,S nomenclature. 5. The student will get the knowledge of aromatic and non-aromatic compounds. 6. The students will understand IUPAC nomenclature, Orbital Structures, synthesis methods, Chemical reaction in Cycloalkanes, cycloalkenes and alkadienes.
	Sem.-II	DSC 3B: Physical Chemistry Paper-III	<ol style="list-style-type: none"> 1. The students will understand law of thermodynamics Spontaneous and non-spontaneous process. 2. The students will be able to discuss Concept of standard state and standard enthalpies of formations & Kirchhoff's equation. 3. The students will be able to discuss Thermodynamic derivation of the law of

			<p>chemical equilibrium & LeChatelier's principle.</p> <ol style="list-style-type: none"> The students get idea about ideal and non-ideal gases, Boyle law, Vander waals equation. The students will identify order and molecularity of a chemical reaction. The student will explain the velocity and productivity of reactions.
		DSC-4B- Analytical Chemistry Paper IV	<ol style="list-style-type: none"> The students will be able to Analytical processes (Qualitative and Quantitative), Sampling, Methods of analysis, Errors & accuracy. The students will understand Chromatography techniques. The students will understand basics of titrations methods. The student will get the knowledge physical analysis of water & chemical analysis The student will get the knowledge Fertilizer analysis.
B.Sc. II CBCS	Sem.-III	DSC- C3 - Physical Chemistry paper No. V	<ol style="list-style-type: none"> The students will understand conductivity and transport number of the aqueous solutions with different applications. The students get knowledge about surface tension, viscosity and refractive index. The students will understand surface phenomena at heterogeneous surfaces. The students will acquire various nuclear phenomena and measurement of nuclear radiations. The students will get the knowledge about third order reaction and theories of reaction rates.
		DSC-C4- Industrial Chemistry paper No. VI	<ol style="list-style-type: none"> The student will explain applications of some important methods of industrial processes. The students will understand basic concepts and concentration terms distinguish between classical and industrial chemistry, unit operations and unit processes. The students will get the knowledge of some unit operations. The students will understand the process of corrosion and Knowledge of prevention from corrosion. The students will get the knowledge of Indian paper industry. The students will get the knowledge about the chemical nature and

			cleansing action of soap.
	Sem.-IV	DSC-D3- Inorganic Chemistry paper No. VII	<ol style="list-style-type: none"> 1. The students will understand basic concepts about coordination complexes. 2. The students will get the knowledge about application of chelates in analytical chemistry. 3. The student will understand the nature, applications of element of p block elements. 4. Student will be capable of understanding the properties of 3d series elements. 5. Student will learn the basic knowledge about the qualitative analysis of inorganic compounds
		DSC- D4 - Organic Chemistry paper No. VIII	<ol style="list-style-type: none"> 1. The students will get the knowledge about the synthesis, reactivity and applications of carboxylic acids. 2. The students will get the knowledge about classification, preparation and applications of amines and diazonium salts. 3. The students will understand the classification, configuration and structure of carbohydrates. 4. Student will be capable of understanding the nomenclature and reactivity of aldehydes and ketones. 5. Student will learn the basic knowledge conformational analysis of organic compounds.
B.Sc. III CBCS	Sem.-V	DSE-E5 - Inorganic Chemistry Paper No. -IX	<ol style="list-style-type: none"> 1. The students will get knowledge about of role of acids and bases, non – aqueous solvents & all chemical properties of solutes. 2. The students will understand geometry, stability and nature of bonding between metal ion and ligand in complexes. 3. The students will understand the synthesis and the applications of the semiconductors and Superconductors in electrical and electronic devices. 4. The students will understand the structure, method of preparation and the applications of organometallic compound in various fields. 5. The students will understand the classification, types, mechanism and applications of catalyst in industrial fields.
		DSE-E6 -	<ol style="list-style-type: none"> 1. The students will understand of energy associated with electromagnetic

		<p style="text-align: center;">Organic Chemistry Paper No. X</p>	<p>radiation and its use in analytical technique.</p> <ol style="list-style-type: none"> 2. The students will get knowledge of chromophore, auxochrome and calculation of λ_{max}. 3. The students will get knowledge of vibrational transitions, regions of IR spectrum, functional group recognition. 4. The students will understand of magnetic, non- magnetic nuclei, shielding-deshielding, chemical shift, splitting pattern. 5. The students will understand of molecular ion, fragmentation pattern and different types of ions produced. 6. Student will predict the structure of organic compound with the help of provided spectral data.
		<p style="text-align: center;">DSE- E7- Physical Chemistry Paper No. XI</p>	<ol style="list-style-type: none"> 1. The students will understand understanding quantum Chemistry, Heisenberg's uncertainty principle, concept of energy operators (Hamiltonian), Schrodinger wave equation, Physical interpretation of the ψ and ψ^2 & particle in a one dimensional box. 2. The students will get 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. 3. The students will understand photochemical laws, reactions and various photochemical phenomena. 4. The students will get knowledge the various types of solutions, relations vapour pressure, temperature relations. 5. The students will get knowledge of emf measurements, types of electrodes, different types of cells, various applications of emf measurements.
		<p style="text-align: center;">DSE-E8- Analytical Chemistry paper No. XII</p>	<ol style="list-style-type: none"> 1. The students will able to understand the techniques of gravimetric analysis. 2. The students will get knowledge of instrumental analysis of alkali and alkaline earth elements. 3. The students will able to understand working and applications of optical

			<p>methods as an analytical tool.</p> <ol style="list-style-type: none"> The students will get knowledge theory and applications of potentiometric titrations. The students will be able to understand the basics of ion exchange and column adsorption chromatography, Quality control practices in analytical industries /laboratories.
Sem.-VI		DSE-F5- Inorganic Chemistry Paper No. –XIII	<ol style="list-style-type: none"> The students will be able to understand the mechanism of the reactions involved in inorganic complexes of transition metals and the thermodynamic and kinetic aspects of metal complexes. The students will be able to understand the generation of nuclear power with the help of nuclear reactions, role of radio isotopes in medicinal, industrial and Archaeology fields. The students will be able to understand the characteristics, properties and separation of lanthanides and Actinides, Synthesis and IUPAC Nomenclature of trans uranic elements (TU). Students will be able to understand iron and steel and their production technique. Students will be able to understand the concept bioinorganic chemistry, role of various metals and non-metals in our health
		DSE-F6- Organic Chemistry Paper No. XIV	<ol style="list-style-type: none"> The students will get knowledge of reagents used in organic transformations and various reactions used in organic synthesis. The students will get knowledge of basic terms used in retrosynthetic analysis,retrosynthesis of some organic compounds. Student will learn addition reaction across $>C=C<$ bond w.r.t. hydrohalogenation, hydration hydroxylation, ozonolysis and addition of halogen,halogen acid, hydrogen, water, etc. across $-C\equiv C-$ bond. The students will get knowledge of terpenoids and alkaloids w.r.t. occurrence, isolation, characteristics and classification, Analytical and synthetic evidences of Citral and Nicotine. Students will be able to understand classification of drugs, qualities of ideal drug, synthesis and uses of some representative drugs and drug action of sulpho drugs.
		DSE-F 7-	<ol style="list-style-type: none"> The students will get knowledge of phase rule, learning of one component,

		<p style="text-align: center;">Physical Chemistry Paper No. XV</p>	<p>two component and three component systems phase diagrams.</p> <ol style="list-style-type: none"> 2. The students will get knowledge about basic concept of thermodynamics, free energy, Gibbs-Helmholtz equation and its applications. 3. Students will able to understand the term solid state chemistry, synthetic applications. 4. Students will able to understand of kinetics, Simultaneous reactions. 5. The students will get knowledge of distribution law, its modifications, applications of distribution laws, process of extraction, determination of solubility, distribution indicators, and molecular weights.
		<p style="text-align: center;">DSE-F8- Industrial Chemistry Paper No. XVI</p>	<ol style="list-style-type: none"> 1. Students will able to understand the whole process of manufacture of sugar and byproducts of sugar industry. 2. Students will able to understand of physicochemical principles of production of ammonia, sulfuric acid, nitric acid and sodium carbonate along with its manufacturing plant. 3. Students will able to understand the classification, synthesis and applications of various polymers. 4. Students will able to understand the petroleum Industry, fuels and need of use of ecofriendly fuels. 5. Students will able to understand of nanotechnology including classification, optical properties, synthesis routes, characterization techniques and applications of nano-materials.