Program outcomes, program specific outcomes and course outcomes of Chemistry Department

Subject specific outcomes	Provide a broad foundation in chemistry that stresses scientific reasoning and Analytical problem solving with a molecular perspective. Achieve the skills required to succeed in graduate school, the chemical industry and professional school. Get exposures of a breadth of experimental techniques using modern instrumentation? Understand the importance of the Periodic Table of the Elements, how it came to be, and its role in organizing chemical information. Understand the interdisciplinary nature of chemistry and to integrate knowledge of mathematics, physics and other disciplines to a wide variety of chemical problems. Learn the laboratory skills needed to design, safely and interpret chemical research. Acquire a foundation of chemistry of sufficient breadth and the depth to enable them to understand and critically interpret the primary chemical literature. Develop the ability to communicate scientific information and research results in written and oral formats. Learn professionalism, including the ability to work in teams and apply basic ethical principles
Program specific outcomes	• After completion of degree, students gained the theoretical as well as practical knowledge of handling chemicals. Also they expand the knowledge available opportunities related to chemistry in the government services through public service commission particularly in the field of food safety, health inspector, pharmacist etc**.** Afford a broad foundation in chemistry that stresses scientific reasoning and analytical problem solving with a molecular perspective. Achieve the skills required to succeed in graduate school, professional school and the chemical industry like cement industries, agro product, Paint industries, Rubber industries, Petrochemical industries, Food processing industries, Fertilizer industries etc. Got exposures of a breadth of experimental techniques using modern instrumentation. Understand the importance of the elements in the periodic table including their physical and chemical nature and role in the daily life. Understand the concept of chemistry to inter relate and interact to the other subject like mathematics, physics, biological science etc. Learn the laboratory skills and safely to transfer and interpret knowledge entirely in the working environment.

GONDWANA UNIVERSITY, GADCHIROLI

CBCS COURSES IN M. SC. CHEMISTRY

SEMESTER – I

PAPER CODE	TITLE OF THE PAPER	INTERNAL ASSESSMENT	TOTAL MARKS	CREDIT
PSCChT01	PAPER-I (INORGANIC CHEMISTRY)	20 MARKS	80 MARKS	4
PSCChT02	PAPER-II (ORGANIC CHEMISTRY)	20 MARKS	80 MARKS	4
PSCChT03	PAPER-III (PHYSICAL CHEMISTRY)	20 MARKS	80 MARKS	4
PSCChT04	PAPER-IV (ANALYTICAL CHEMISTRY)	20 MARKS	80 MARKS	4
PSCChP01	PRACTICAL-I (INORGANIC CHEMISTRY)	20 MARKS	80 MARKS	4
PSCChP02	PRACTICAL-II (ORGANIC CHEMISTRY)	20 MARKS	80 MARKS	4
PSCChP03	SEMINAR I		25 MARKS	1

SEMESTER – II

PAPER CODE	TITLE OF THE PAPER	INTERNAL ASSESSMENT	TOTAL MARKS	CREDIT
PSCChT05	PAPER-V (INORGANIC CHEMISTRY)	20 MARKS	80 MARKS	4
PSCChT06	PAPER-VI (ORGANIC CHEMISTRY)	20 MARKS	80 MARKS	4
PSCChT07	PAPER-VII (PHYSICAL CHEMISTRY)	20 MARKS	80 MARKS	4
PSCChT08	PAPER-VIII (ANALYTICAL CHEMISTRY)	20 MARKS	80 MARKS	4
PSCChP04	PRACTICAL-III (PHYSICALCHEMISTRY)	20 MARKS	80 MARKS	4
PSCChP05	PRACTICAL-IV(ANALYTICAL CHEMISTRY)	20 MARKS	80 MARKS	4
PSCChP06	SEMINAR II		25 MARKS	1

SEMESTER – III

PAPER	TITLE OF THE PAPER	INTERNAL	TOTAL	CREDIT

CODE		ASSESSMENT	MARKS	
PSCChT09	PAPER-IX (SPECTROSCOPY)	20 MARKS	80 MARKS	4
PSCChT10	PAPER-X (SPECIAL-I) • ORGANIC CHEMISTRY	20 MARKS	80 MARKS	4
PSCChT11	PAPER-XI (SPECIAL-II) • ORGANIC CHEMISTRY	20 MARKS	80 MARKS	4
PSCChT12	PAPER-XII (ELECTIVE) • MEDICINAL CHEMISTRY	20 MARKS	80 MARKS	4
PSCChP07	PRACTICAL-VII (SPECIAL) • ORGANIC CHEMISTRY	20 MARKS	80 MARKS	4
PSCChP08	PRACTICAL-VIII (ELECTIVE) • MEDICINAL CHEMISTRY	20 MARKS	80 MARKS	4
PSCChP09	SEMINAR III		25 MARKS	1

SEMESTER – IV

PAPER CODE	TITLE OF THE PAPER	INTERNAL ASSESSMENT	TOTAL MARKS	CREDIT
PSCChT13	PAPER-XIII (SPECTROSCOPY)	20 MARKS	80 MARKS	4
PSCChT14	PAPER-XIV (SPECIAL-I) • ORGANIC CHEMISTRY	20 MARKS	80 MARKS	4
PSCChT15	PAPER-XV (SPECIAL-II) • ORGANIC CHEMISTRY	20 MARKS	80 MARKS	4
PSCChT16	PAPER-XVI (ELECTIVE) • MEDICINAL CHEMISTRY	20 MARKS	80 MARKS	4
PSCChP10	PRACTICAL-X (SPECIAL) • ORGANIC CHEMISTRY	20 MARKS	80 MARKS	4
PSCChP11	PRACTICAL-XI (PROJECT)	20 MARKS	80 MARKS	4
PSCChP12	SEMINAR IV		25 MARKS	1

Course specific outcomes M.Sc. Chemistry

Semester	Title	Course specific outcomes
I	INORGANIC CHEMISTRY	Study of • stereochemistry and bonding in main group compounds. • Metal ligand bonding. • Metal ligand equilibrium in solution

		• Boron hydrides, Chemistry of Diboranes • Metal- metal bond and Isopoly, Heteropoly acids and their anions
	ORGANIC CHEMISTRY	Study of • Nature and Bonding in Organic Molecules • Stereochemistry of Cycloalkanes, cyclohexane and Asymmetric Synthesis • Reactive Intermediate • Reaction Mechanism: Structure and Reactivity. • Aliphatic Nucleophilic Substitution. • Aromatic Electrophilic Substitution. • Aromatic Nucleophilic Substitution.
	PHYSICAL CHEMISTRY	Understanding on the details of the basic • Formulation of Quantum Mechanics. • Classical Thermodynamics. • Phase Equilibria. • Chemical Kinetics.
	ANALYTICAL CHEMISTRY	They will gain an understanding of the • Introduction and Statistical Analysis. • Separation Technique • Classical Methods of Analysis. • Optical Methods of Analysis.
	BASED ON THEORY PAPER 1 AND 2	• Practical based on paper 1 and 2
	BASED ON THEORY PAPER 3 AND 4	• Practical based on paper 3 and 4
	SEMINAR I	• Improve the presentation skill
II	INORGANIC CHEMISTRY	Course will provide knowledge regarding the • Electronic Spectra And Magnetic Properties of Transition Metal Complexes • Reaction Mechanism of Transition Metal Complexes. • Metal Carbonyl and Metal Nitrosyls Pi Complex
	• ORGANIC CHEMISTRY	Students understand how the • Addition to Carbon-Carbon Multiple bond • Addition to Carbon-Hetero atom multiple bond. • Mechanism of Molecular Rearrangement • Free radical Reaction Aromatic and Aliphatic Substrate

		• Alkyl , Allylic and Aromatic carbon • Elimination Reaction • Green Chemistry
	PHYSICAL CHEMISTRY	It gives insight into • Understanding of Applications of Quantum Mechanics • Thermodynamics. • Solid sate Chemistry. • Nuclear Chemistry.
	ANALYTICAL CHEMISTRY	• Students will learn Sampling and Quantification • Will learn fundamental of Modern Separation Techniques • Will learn the principles of various optical Methods of Analysis. • Will learn fundamental of Electrochemical Methods Of Analysis
	BASED ON THEORY PAPER 5 AND 6	• Practical based on paper 5 and 6
	BASED ON THEORY PAPER 7 AND 8	• Practical based on paper 7 and 8
	SEMINAR 2	• Improve the presentation skill
III	SPECTROSCOPY	• Provides basics knowledge about Symmetry Properties Of Molecules Of Group Theory • Basic Principles and Experimental Techniques involved in Mass Spectrometry and Mossbauer spectroscopy • Basic Principles involved in Microwave and ESR spectroscopy • Ability to understand concepts of IR and RAMAN spectroscopy
	ORGANIC CHEM.(SPECIAL –I)	• Students will learn the detailed concepts of Photochemistry and reactions • In depth knowledge of various Pericyclic Reactions • In depth knowledge of various Oxidation Reactions of Hydrocarbon, Aldehydes, Ketones and Alcohols • In depth knowledge of various Reduction Reactions in Organic Compounds • Students will learn the detailed Chemistry of P, S, Si, B, and Ti

	ORGANIC CHEM.(SPECIAL –II)	• Imparts knowledge about various Terpenoids and Porphyrins • Students gain knowledge of Alkaloides and Postaglandines. • Understanding of Steroids and Plant Pigments. • In depth knowledge of various Carbohydrates, Amino acids, Portions and Peptides
	MEDICINAL CHEMISTRY (ELECTIVE)	• Provides basics knowledge about Drugs like Anti-Inflammatory, Diuretics, Analgesic and Antipyretics • Basic Principles and Experimental Cardiovascular Drugs • Basic Principles involved Anti-neoplastic and Anti-diabetic Agents • Ability to understand concepts of Psychoactive Drug and Anticoagulants
	BASED ON THEORY PAPER 9	• Practical based on paper 9
	BASED ON THEORY PAPER SPECIAL GROUP 1 AND 2	• Practical based on paper 10 and 11
	SEMINAR 3	• Improve the presentation skill
IV	SPECTROSCOPY	• Students gain knowledge about various tools and techniques such as UV-Visible Spectroscopy NMR, Photoelectron Spectroscopy and gives them insight about their use in research. • Students gains knowledge about Diffraction Techniques Such as X-ray and Neutron
	ORGANIC CHEMISTRY (SPECIAL-I)	• Course provides students comprehensive understanding about Carbanions in Organic Chemistry • It gives comprehensive understanding regarding Synthesis, and Applications of Organometallic Reagents • Understanding of the Advanced Stereochemistry. • Designing the synthesis based on retro synthesis Analysis
	ORGANIC CHEMISTRY (SPECIAL-II)\	• It gives comprehensive understanding

		regarding Enzyme Chemistry. • Learn about Structure and Chemical Properties of Pyrazole, isothiozole and isoxazole. • Learn about Structure and Chemical Properties of Nucleic Acid, Lipids and Vitamins. • General introduction and Its Applications Dyes, Pharmaceutical and polymer Chemistry
	PRACTICAL BASED ON THEORY PAPER SPECIAL GROUP 3 AND 4	• Practical based on paper 14 and 15
	PROJECT	• Make research proposal • Construct tool of data collection • To Develop Research Attitude and Methodology • Understand the process of Referencing • To Understand Spectral and Experimental Data Analysis. • Writing research report.
	SEMINAR 4	• Improve the presentation skill