RAYAT SHIKSHAN SANSTHA'S

SHREE SADGURU GANGAGEER MAHARAJ SCINCE, GAUTAM ARTS & SANJIVANI COMMERCE COLLEGE, KOPARGAON DIST AHMEDNAGAR

Program Outcomes, Program Specific Outcomes and Course Outcome

Department of Chemistry

Program Outcome : M.Sc. (Analytical Chemistry)	
PO1.	• Demonstrate, solve and an understanding of major concepts in all disciplines of Chemistry.
PO2.	• Solve the problem and also think methodically, independently and draw a logical conclusion.
PO3.	• Create an awareness of the impact of chemistry on the society, and development outside the scientific community.
PO4.	• Become professionally trained in the area of Industry, material science, lasers and Nano-Technology
PO5.	• Employ critical thinking and the scientific knowledge to design, carry out, record and analyze the results of Chemistry experiments
PO6.	• To inculcate the scientific temperament in the students and outside the scientific community.
PO7.	• Apply modern methods of analysis to chemical systems in a laboratory setting.

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Program Outcomes, Program Specific Outcomes and Course Outcome

Department of Chemistry

Program Specific outcome : M.Sc. (Analytical Chemistry)	
PSO1.	• Learn about the potential uses of analytical industrial chemistry.
PSO2.	• Carry out experiments in the area of organic analysis, estimation, separation, derivation process, conduct metric and potentiometric analysis.
PSO3.	• Learn the classical status of thermodynamics.
PSO4.	• Gathers attention about the physical aspects of atomic structure, various energy transformation, molecular assembly in nano level and significance of electrochemistry.
PSO5.	• Understand good laboratory practices and safety.
PSO6.	• Introduce advanced techniques and ideas required in developing area of Chemistry.
PSO7.	• Make aware and handle the sophisticated instruments/equipments.
PSO8.	• Enhance students‟ ability to develop mathematical models for physical systems

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Program Outcomes, Program Specific Outcomes and Course Outcome

Department of Chemistry

Program Outcome : M.Sc. (Organic Chemistry)	
PO1.	• Determine molecular structure by using UV, IR and NMR.
PO2.	• Study of medicinal chemistry for lead compound.
PO3.	• Improve the Skill of student in organic research area.
PO4.	• Synthesis of Natural products and drugs by using proper mechanisms.
PO5.	• Study of Asymmetric synthesis.
PO6.	• Determine the aromaticity of different compounds.
PO7.	• Solve the reaction mechanisms and assign the final product.

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Program Outcomes, Program Specific Outcomes and Course Outcome

Department of Chemistry

Program Specific Outcome : M.Sc. (Organic Chemistry)	
PSO1.	• Know the structure and bonding in molecules/ ions and predict the Structure of molecule/ions.
PSO2.	• Understand the various type of aliphatic, aromatic, nucleophilic substitution reaction.
PSO3.	• Understand and apply principles of Organic Chemistry for understanding the scientific phenomenon in Reaction mechanisms.
PSO4.	• Learn the Familiar name reactions and their reaction mechanisms.
PSO5.	• Understand good laboratory practices and safety.
PSO6.	• Study of organometallic reactions.
PSO7.	• Study of free radical, bycyclic compound, conjugate addition of Enolates and pericyclic reactions.
PSO8.	• Study of biological mechanisms using amino acids

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Program Outcomes, Program Specific Outcomes and Course Outcome
Department of Chemistry

Course Outcomes of M.Sc.(Analytical, Organic Chemistry)

Class	Course title	Outcome
M.Sc. I (Organic and Analytical Chemistry)	CHP-110 Physical Chemistry	• Realize the terms ionic strength, activity coefficient, DHO equation. • Know the Eigen function, Eigen value, operator and postulates of quantum mechanics. • Learn two and three dimensional box, mechanics of particle. • Understand the adsorption of gases by solid type of isotherms • Recognized the Fricke and cerric sulphate Dosimeter.
	CHI-130 Inorganic Chemistry	• 1 Determine and Learn about Dipole moment and bond order ofThe inorganic molecule. • Learn about geometry and shape of the molecule. • Known the preparation and properties of transition metal carbonyls • To understand the 18 electron rule and its application. • Find out the point group of inorganic molecules. Learn molecular orbital and its orientation.
	CHO-150 Basic organic Chemistry	• Learn SN1, SN2 and SNi Mechanism and stereochemistry • Learn classical and non-classical carbocation, • NGP by pi and sigma bonds. • Solve the elimination problems. • Distinguish between type of addition, elimination and substitution reaction • Learn E and Z nomenclature inC,N,S,P containing compound ,Stereochemical principal, enantiomeric relationship R and S.
	CHA-190 General Chemistry	• Study the importance of safety and security, responsibility types of hazards and risk in chemical laboratory. • Understand the use of personal protective and other safety equipments, handling of chemical in laboratory. • Understand the route of explores for toxic chemicals • Learn good laboratory practices and its applications

M.Sc. I (Organic, Analytical Chemistry)	CHP-210 Physical Chemistry	• Learn the thermodynamic description of exact, inexact differential and state function. • Know the qualitative properties of solution, the depression in freezing point, elevation in boiling point and osmotic pressure.
	CHI-230 Inorganic Chemistry	• Understand the mechanism in transition metal complexes, Born Habercycle to calculate lattices energy. • Learn the use of catalyst, radius ratio rule of coordination number 3 • Study the structure of atom, Hunds rule, term symbol, calculation of microstate and selection rule.
	CHO-250 Name reaction, synthetic Organic Chemistry and spectroscopy	• Study the various name reaction with examples. • Learn the mechanism of rearrangement reaction, use synthetic reagent of oxidation and reduction for solving the problems. • Understand the factors affecting UV-absorption spectra, Interpret IR spectra on basic values of IR-frequencies. • Discuss the problem of UV, IR and NMR.
	CHA-290 General Chemistry	• Study the instrumentation, sample injection system, columns for HPLC and GC, Solvent treatment system and choice of mobile phase. • Learn instrumentation of mass spectrometry, fragmentation, structure determination • Solve mean and standard deviation problems. • Understand the accuracy and precision and classification error. • Learn distillation, solvent extraction, crystallization, and other separation techniques.
	CHP-107 Physical chemistry practical's	• Calculate molar and normal solution of various concentrations. • Determine specific rotations and percentage of optically active substances by polorimetricall • Study the energy of activation and second order reaction. • Study the stability of complex ion and stranded free energy changeand equilibrium constant by potentiometry. Find out the acidity, Basicity and PKa Value on pH meter
	CHI-147 Inorganic chemistry practical's	• Study the gravimetric and volumetric analysis of ores and alloy. • Prepare a various inorganic complexes and determine its % purity. Preparation of nonmaterial.

M.Sc. I (Organic, Analytical Chemistry)	CHO-247 Organic chemistry practical's	• Perform the ternary mixtures, preparation of organic compounds, their purifications and run TLC. • Determination of physical constant: Melting point, Boiling point, different separation techniques.
M.Sc. II (Organic Chemistry)	CHO-350- Organic Reaction Mechanism	• Learn the reaction mechanism of nucleophile with elecrophile • Learn the acidity and basicity in organic compounds
	CHO-351- Organic Spectroscopy	• Understand the PMR and CMR values and their predictions • Understand the prediction of 2-D spectra
	CHO-352- Organic Spectroscopy	• Understand the 3-D way view of cyclohexane and related cyclic compounds • Learn to stereo-chemical principles with stereochemistry • Able to find out Cotton effect of different cyclic and acyclic molecules
	CHO-353- Photochemistry, Pericyclic and Heterocyclic chemistry	• Understand the electronic movements in thermal and photochemical excitations, their effects in reactions • Learnt about aromatic electrophilic and nucleophic substitution reactions involving variety of heterocycles such as prrrole, furan, thiophene, quinoline, isoquinoline, etc. • In addition, various syntheses have been studied.
	CHO-347- Single Stage Preparation	• Get the idea about reaction set up • Understand the importance of purification techniques recrystallization during TLC and physical const. determination
M.Sc. II (Analytical Chemistry)	CHA-390 Electro analytical and radio analytical methods of analysis	• Study of colorimeter, Faraday 1st law, Faraday 2nd law. • Study of voltametry and paleographic method of analysis, • heterodynamic voltametry, plus paleography and cyclic voltametry. • Study of ampherometry and their application
	CHA-391 Pharmaceutical analysis.	• Study of apparatus for test and assay, cleaning of glassware, role of FDA in pharmaceutical industry. • Learn biological test and assay, microbiological test and assay, physical test, determination, limit test sterilization. • Analysis of vegetable drug, sources of impurities in pharmaceutical row materials and finished products. • Learn standardization and quality control of different row materials.
	CHA-392 Advanced analytical techniques	• Study the classical approach for aqueous extraction, solid phase extraction, micro extraction and SFE. • Learn: AAS, FES, ICPAES, and DCP. • Study atomic fluorescence, resonant ionization and LASER based enhanced ionization • Study of different detectors and their applications.

M.Sc. II (Analytical Chemistry)	CHA-380 Geochemical and alloy analysis and analytical method development and validation.	• To understand assay validation and inter laboratory transfer. • Study the statistical analysis and analytical figure. • Learn the analysis of geological materials and alloys. • Study the analysis of soil, sampling, chemical analysis as a measure of soil fertility
M.Sc. II (Organic Chemistry)	CHO-450-Natural Products	• Learn the idea of protection and deprotection for the synthesis of large, multistep organic compounds • Learn the use of naturally occurring small precursors for synthesis of big molecules
	CHO-451-Advanced Synthetic Organic chemistry	• Understand synthesis of C-C ,C=C bond formations using organometallic compounds • Understand the multicomponent reactions,click chemistry, importance of B and Si in organic synthesis
	CHO-452-Carbohydrates, Chiron approach and medicinal chemistry	• Learn the idea of protection and deprotection for the synthesis of multistep, large organic compounds • Learn the use of naturally occurring small precursors for synthesis of big drug molecules • iii) Importance of naturally occurred chiral precursors in medicinal and drug development
	CHO-453-Designing Organic Synthesis and asymmetric synthesis	• Learnt about the protection and deprotection concept in organic synthesis. Various protecting groups of hydroxyl, amine, ester, and aldehyde and ketones were studied. Also learnt about retrosynthetic approaches.
	CHO-447-Double Stage Preparation	• Get the idea about monitoring of organic reactions using TLC technique • Understand about importance of quality of product by TLC and physical constant
	CHO-448-Green Chemistry/ Biochemical expts.	• Understand about the product purification by recrystallization • Understand the importance of green reagents and methods in organic synthesis
M.Sc. II (Analytical chemistry)	CHO-490 Analytical spectroscopy	• Study of ESCA, Detectors and their applications. Learn X-ray method of analysis, numerical problems. • Understand an introduction to microscopy, its applications. • Study of chemiluminescences, Fluorescence and phosphorescence. • Study of NMR spectroscopy

M.Sc. II (Analytical chemistry)	CHO-491 Analytical methods for analysis of fertilizer detergent, water and polymer paint and pigments.	• Study of analysis of fertilizer, sampling and sample preparation, kjeldal's method. • Understand the analysis of soap and detergents, UV-spectroscopic analysis of detergent. • Study of water pollution and analysis of polluted water
	CHA-492 Pollution monitoring and control and analysis of body fluid.	• Study of pollution monitoring, removal of heavy toxic metals Cr, Hg, Cd, Pb, As. • Learn the removal of particulate matters, SO2 and NOx. • Study the collection of specimen blood, urine, faeces. • Learn the analysis of blood and urine, Vitamin in body fluid. • Study the liver function and kidney function test.
	CHA-481 Analytical toxicology and food analysis.	• Study of acute poisoning, clinical toxicology. • Learn the isolation, identification and determination of narcotics, stimulants and depressants. • Study the classification function, analysis of carbohydrate, Protein, lipid. • Study the food preservatives, identification determination, and composition.
	CH-A-387 Analysis of materials	• Study the gravimetric and volumetric analysis of ores and alloy. • Prepare a various inorganic complexes and determine its % purity. • Preparation of nonmaterial. • To understand the chromatographic techniques. • Estimation of Iron by Various methods.
	CH-A-487 Instrumental Analysis	• Spectral analysis best on instrumental techniques • Photometric determination. • Study of Conductometer, FES, Polarography. • Analysis of riboflavin by photoflurometry. • To Study the spectroscopic techniques. • To study the terbidometry and Neflometry
	CH-A-488 Single stage preparations by Green synthesis.	• Study the dissolution of tablet. • Learn the spectroscopic techniques. • Study Volumetric and gravimetric estimation. • Analysis of Quinine sulphate by photoflurometry