



MUHAMMED ABDURAHIMAN MEMORIAL ORPHANAGE (MAMO) COLLEGE

[Govt. Aided First Grade College & Affiliated to University of Calicut. Re-Accredited by NAAC with A Grade]



OFFICE OF THE PRINCIPAL

PEOs, PSOs, POs & COs M.Sc CHEMISTRY

1. PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

Table 1: Programme Educational Objectives of M.Sc Chemistry

PEO1	Acquire the fundamental principles of science and chemistry with modern experimental and computational skills.
PEO2	Handle problems of practical relevance to society while complying with economical, ethical and safety factors.
PEO3	Demonstrate professional excellence, ethics, soft skills and leadership qualities
PEO4	Have sufficient breadth of understanding to enable continued professional development and lifelong learning throughout their career

2. PROGRAMME SPECIFIC OUTCOMES (PSOs)

Table 2: Programme Specific Outcomes of M.Sc Chemistry

PSO1	Gain the knowledge of Chemistry through theory and practical's.
PSO2	To explain nomenclature, stereochemistry, structures, reactivity, and mechanism of the chemical reactions.
PSO3	To familiarize with the emerging areas of chemistry and their applications in various spheres of chemical sciences and to apprise the students of its relevance in future studies
PSO4	Understand good laboratory practices and safety.
PSO5	To be conversant with the applications of chemistry in daytoday life.

3. PROGRAMME OUTCOMES (POs)

Table 3: Programme Outcomes of M.Sc Chemistry

PO1	Demonstrate, solve and an understanding of major concepts in all Disciplines of chemistry
PO2	critical thinking and the scientific knowledge to design, carry out, record and analyze the results of chemical reactions.



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Table 3: Programme Outcomes of M.Sc Chemistry

P03	Create an awareness of the impact of chemistry on the environment, society, and development outside the scientific community
P04	Find out the green route for chemical reaction for sustainable development
P05	To inculcate the scientific temperament in the students and outside the scientific community
P06	Use modern techniques, decent equipment and Chemistry software's
P07	To demonstrate professional and ethical attitude with enormous responsibility to serve the society.
P08	To apply contextual knowledge and modern tools of chemistry research for solving problems
P09	An understanding of professional, ethical, legal, security, social issues and responsibility
P010	Be acquainted with the contemporary issues latest trends in technological development and thereby innovate new ideas and solutions to existing problems.

4. COURSE OUTCOMES (COs)

Table 4: Courses Outcomes of M.Sc Chemistry

COURSE 1: CHE1C01 -Quantum Mechanics & Computational Chemistry

C01	Know the Eigen function, Eigen value, operator and postulates of quantum mechanics.
C02	Learn two and three dimensional box, mechanics of particle.
C03	Understand the adsorption of gases by solid type of isotherms
C04	Recognized the Fock contribution.
C05	Learn ladder operator and space quantization.

COURSE 2: CHE1C02 Elementary inorganic Chemistry



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Table 4: Courses Outcomes of M.Sc Chemistry

C01	Determine and Learn about Dipole moment and bond order of the inorganic molecule.
C02	Learn about geometry and shape of the molecule.
C03	Known the preparation and properties of transition metal carbonyls
C04	To understand the 18 electron rule and its application.
C05	Find out the point group of inorganic molecules.

COURSE 3: CHE1C03 Structure and Reactivity of organic Compounds

C01	Learn SN1, SN2 and SNi Mechanism and stereochemistry.
C02	Learn classical and non-classical carbocation, NGP by pi and sigma bonds.
C03	Solve the elimination problems.
C04	Distinguish between type of addition, elimination and substitution reaction
C05	Learn E and Z nomenclature in C, N, S, P containing compound, Stereochemical principal, enantiomeric relationship R and S.

COURSE 4: CHE1C04 Thermodynamics, Kinetics and Catalysis

C01	Learn the thermodynamic description of exact, inexact differential and state function.
C02	Know the qualitative properties of solution, the depression in freezing point, elevation in boiling point and osmotic pressure..
C03	Know the statistical thermodynamics and various partition functions.
C04	Study the steady state approximation michaelis- menten mechanism.

COURSE 5: CHE2C05 Group Theory and Chemical Bonding

C01	To study the basic postulates of quantum mechanics
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C02	To enable the students to solve the simple quantum mechanical models such as simple harmonic oscillator, particle in a 1D- box, rigid rotor, H atom etc.
C03	To understand the quantum mechanical aspect of angular momentum and spin.
C04	Enable the students to predict the point group of important molecules and to know how they are classified
C05	To understand the idea of space groups and to learn the theory of molecular Symmetry.

COURSE 6: CHE2C06 Coordination Chemistry

C01	To know the structure and bonding of important coordination compounds
C02	To understand the magnetic properties of complexes and to know how magnetic moments can be employed for the interpretation of their structure.
C03	To get an overview about the stereochemistry of coordination compounds

COURSE 7: CHE2C07 Reaction Mechanism in Organic Chemistry

C01	To know the various methods employed for reactions like oxidation, reduction, carbocyclic and heterocyclic ring formation etc.
C02	To get insights into novel reactions and reagents in organic synthesis
C03	To know the utility of protecting group strategy in organic synthesis
C04	To be familiarize the students with the basic principles of retro syntheses, biosynthesis and biomimetic synthesis

COURSE 8: CHE2C08 Electrochemistry, Solid State & Statistical Thermodynamics

C01	To know the basic concepts in classical thermodynamics and to learn the thermodynamic aspects of various processes and reactions
C02	To understand the different aspects of statistical thermodynamics and its applications.
C03	To know the basic concepts in classical thermodynamics and to learn the thermodynamic aspects of various processes and reactions



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Table 4: Courses Outcomes of M.Sc Chemistry

C04	To understand the different aspects of statistical thermodynamics and its applications.
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COURSE 9: CHE1L01 & CHE2L04 Inorganic chemistry Practicals

C01	Perform the Binary mixtures.
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C02	Preparation of organic compounds, their purifications and run.
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COURSE 10: CHE1L02 & CHE2L05 Organic chemistry Practicals

C01	Study the gravimetric and volumetric analysis of ores and alloy..
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C02	Prepare a various inorganic complex and determine its % purity
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COURSE 11: CHE1L03 & CHE2L06 Physical chemistry Practical

C01	Calculate molar and normal solution of various concentrations.
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C02	Determine specific rotations and percentage of to optically active substances by polarimetrically.
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C03	Study the energy of activation and second order reaction.
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C04	Study the stability of complex ion and stranded free energy change and equilibrium constant by potentiometry.
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C05	Find out the acidity, Basicity and PKa Value on Ph meter
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COURSE12: CHE3C09 Molecular Spectroscopy

C01	Study ¹ H NMR Spectroscopy: Chemical Shift, deshielding, correlation for protons bonded to carbon and other nuclei.
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C02	Study of ¹³ C NMR spectroscopy: FT- NMR, type of ¹³ C NMR spectra, proton decoupled off resonance, APT, INEPT, DEPT, Chemical shift, nuclear and hetero nuclear coupling constant.
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C03	2D NMR techniques: COSY, homo and hetero nuclear 2D resorts spectroscopy, NOESY and the applications.
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Table 4: Courses Outcomes of M.Sc Chemistry

C04	Study of mass spectrometry: Instrumentation, various methods of ionization, SIMS, FAB, MALDI. Different detectors rules of fragmentations of different functional groups.
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COURSE 13: CHE3C10 Organometallic & Bioinorganic Chemistry

C01	To enable students to understand computation of income under various heads, taxable income of various entities, tax planning and procedure of assessment.
C02	To understand the procedure for registration, payment and refund of GST
C03	To know tax related with movement of goods and To understand the appeals, offences and penalties with respect to GST
C04	To create employability to the students in the commercial tax practices

COURSE 14: CHE3C11 Reagents & Transformations in Organic Chemistry

C01	To understand the basic concepts and mechanism in organic chemistry.
C02	To get an idea about the various kinetic and thermodynamic factors which control the organic reactions.
C03	To know stereochemistry and various possible conformations of organic compounds and how it affects the reaction outcome.
C04	To be familiarize with the important photochemical reactions in Organic Chemistry.

COURSE 15: CHE3E01 Synthetic Organic Chemistry

C01	To know the various methods employed for reactions like oxidation, reduction, carbocyclic and heterocyclic ring formation etc.
C02	To get insights into novel reactions and reagents in organic synthesis
C03	To know the utility of protecting group strategy in organic synthesis
C04	To be familiarise the students with the basic principles of retro syntheses, biosynthesis and biomimetic synthesis

COURSE 16: CHE3C09 Instrumental Methods Of Analysis



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Table 4: Courses Outcomes of M.Sc Chemistry

C01	To know the different treatment of analytical data.
C02	To understand the conventional analytical procedures used in Laboratories.
C03	To have an idea about of basic instrumental techniques of electroanalytical and optical methods.
C04	To understand the instrumentation, principle and applications of Thermal and radiochemical methods.
C05	To have a basic idea about Chromatography.

COURSE 17: CHE4E05 Industrial Catalysis

C01	To learn the different theories of reaction rates and factors affecting reaction rates.
C02	To have an idea about the different types of catalysis and their mechanisms.
C03	To study the chemistry of surfaces and different types of surface phenomena.
C04	To get an idea about the various techniques employed for the characterization of surfaces.
C05	To know the general properties of colloids and macromolecules.

COURSE 18: CHE4E08 Organometallic Chemistry

C01	To know the basics and importance of Organometallic compounds
C02	To understand bonding and reactions of metal carbonyls.
C03	Evaluating molecular orbital treatment in Organometallic complexes.
C04	To have an ideas about Organometallic polymers.
C05	To understand the applications of organometallic compounds in Organic synthesis and catalysis.



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Table 4: Courses Outcomes of M.Sc Chemistry

COURSE 19: CHE3L07, CHE4L10 Inorganic chemistry Practicals

C01	Enable the students to estimate the binary mixtures of metallic ions by volumetric and gravimetric methods.
C02	To understand the estimation involving quantitative separation of suitable mixtures.
C03	To study the applications of Colorimetric estimation

COURSE 20: CHE3L08, CHE4L11 Organic chemistry Practicals

C01	To gain the skill to prepare organic compounds using greener protocols.
C02	Enable the students to prepare organic compounds via two step synthetic sequences
C03	To study quantitative organic analysis.
C04	Analysis of samples using paper chromatography

COURSE 21: CHE3L09 & CHE4L12 Physical Chemistry Practical

C01	Enable the students to determine the various physical properties using simple instrumental methods like polarimetry, refractometry etc.
C02	To study about the reaction kinetics experimentally.
C03	Verification of Langmuir Adsorption isotherm
C04	To understand the phase equilibria of ternary liquid systems.



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