

FATIMA MATA NATIONAL COLLEGE

AUTONOMOUS

(Reaccredited with 'A' Grade by NAAC)

Affiliated to University of Kerala



OUTCOME MAPPING

IQAC INTERNAL QUALITY ASSURANCE CELL

BSc CHEMISTRY

PROGRAMME OUTCOMES (POs)

PO 1	Nationalistic Outlook and Contribution to National development: Understand the distinct features of nationalistic outlook as enshrined in our Constitution and apply them towards national development, and nurture respect and love for the motherland, showing no discrimination based on gender, caste and creed.
PO 2	Fostering Global Competencies, and Technical and Intellectual proficiency: Apply intellectual and technical skill to compete in a global setting and demonstrate proficiency in creating and applying appropriate technique, resources and modern IT tools for ensuring greater personal growth and global outlook.
PO 3	Values and Social Commitment: Demonstrate the essence of human values through acts of social commitment, develop professional ethics and responsibilities; function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings; show respect for fellow beings by fair treatment, caring and concern; listen responsively, recognize the contributions of others, and engage in reflective practice; imbibe spirit of selfless service.
PO 4	Affective Skills and Integrity of Character: Receive affective skills and organize activities displaying integrity of character, foster qualities such as emotional self-awareness, emotional reasoning and emotional self-management for addressing workplace challenges, and develop personal integrity and character.
PO 5	Critical Thinking, Problem Solving and Research-related Skills: Develop critical thinking, and psycho-motor skills, create a sense of inquiry and research skills and take an analytical approach to learning for cutting edge areas.
PO 6	Environment and Sustainability: Design measures which meet the global agenda of environment protection and sustainable development, develop consciousness to preserve the earth's finite resources, and wisdom, to balance human needs and the environment, and to instill an environmental consciousness.
PO 7	Quest for Excellence: Receive skills towards holistic development and quest for excellence, recognize the need for, and have the preparation and ability to engage in an independent and life-long learning in the broadest context of technological change, develop healthy competition and setting parameters for excellence.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

The Department of Chemistry, Fatima Mata National College (Autonomous), Kollam, offers Three Year (comprising 6 semesters) Undergraduate Programme in Chemistry with the primary objective of equipping students to acquire wide-ranging knowledge of Chemistry as an academic discipline. Upon successful completion of B. Sc. Chemistry Degree Programme the student shall acquire the following knowledge and competencies.

PSO 1	Develop linguistic skills and literary sensibility, and demonstrate an awareness on environment, disaster management and its associated problems.
PSO 2	Develop language proficiency, literary sensibility, values and critical thinking
PSO 3	Understand the basic concepts of the different branches of chemistry.
PSO 4	Perform experiments in a wide range of areas of qualitative and quantitative analysis.
PSO 5	Apply research methodologies, effective communication and problem-solving skills.
PSO 6	Analyse the basic concepts of calculus, linear algebra and solve problems using numerical methods, differential equations and probability theory.
PSO 7	Describe concepts in optics and magnetism and thermodynamics, electronics and spectroscopy.

PSO – PO MAPPING

		POs						
		1	2	3	4	5	6	7
PSOs	1	*					*	*
	2	*	*	*		*		*
	3					*		
	4				*	*		
	5		*			*		
	6					*		
	7					*		

COURSE OUTCOMES (COs)

SEMESTER I

Course Code: 19UEN111.1

English I – LANGUAGE SKILLS

Upon completion of this course, the student will be able to:		PSO
CO 1	Understand the basics of Phonetics	1
CO 2	Apply language skills in daily life situations.	1
CO 3	Demonstrate sophisticated writing skills	1
CO 4	Analyze and evaluate English literature	1

Course Code: 19UFR/HN/ML 111.1

Additional Language I

19UFR111.1 - COMMUNICATION SKILLS IN FRENCH

Upon completion of this course, the student will be able to:		PSO
CO 1	Demonstrate a good comprehension of simple conversational French.	2
CO 2	Use basic French expressions in daily communication.	2
CO 3	Develop short and intelligible texts in French on simple topics.	2

19UHN111.1 - PROSE AND ONE ACT PLAYS

Upon completion of this course, the student will be able to:		PSO
CO 1	Acquire knowledge about various forms of prose genres.	2
CO 2	Develop an awareness of theatre and stagecraft.	2
CO 3	Understand social values and social relationships.	2

19UML 111.1 - MALAYALA KAVITHA

Upon completion of this course, the student will be able to:		PSO
CO 1	Identify and illustrate the features of Ancient Literature.	2
CO 2	Understand Ancient Vocabulary.	2
CO 3	Categorize different Poetic Styles.	2

Course Code: 19UEN121

Foundation Course I – WRITINGS ON CONTEMPORARY ISSUES

Upon completion of this course, the student will be able to:		PSO
CO 1	Analyze issues of human rights in the society.	1
CO 2	Understand and evaluate grave issues of society.	1
CO 3	Analyze and address gender issues.	1
CO 4	Discuss the effects of substance abuse.	1

Course Code: 19UCH141

Core Course I – INORGANIC CHEMISTRY - I

Upon completion of this course, the student will be able to:		PSO
CO 1	Explain the fundamental characteristics of basic chemical science.	3
CO 2	Apply principles of organic chemistry to explain the processes in flora and fauna.	4
CO 3	Demonstrate scientific methods for scientific data analysis and interpretation.	5

Course Code: 19UMM131.2

Complementary Course I – CALCULUS WITH APPLICATIONS IN CHEMISTRY - 1

Upon completion of this course, the student will be able to:		PSO
CO 1	Apply differentiation and integration in processes related to chemistry.	7
CO 2	Explain Complex numbers, Hyperbolic functions and their applications.	7
CO 3	Analyse basics of vector Algebra.	7

Course Code: 19UPH131.2

Complementary Course II – ROTATIONAL DYNAMICS AND PROPERTIES OF MATTER

Upon completion of this course, the student will be able to:		PSO
CO 1	Describe moment of inertia of various rigid bodies, determination of surface tension and viscosity of liquids.	6
CO 2	Examine the theory of oscillations and waves.	6
CO 3	Appraise material properties like Young's modulus of various materials.	6

SEMESTER II

Course Code: 19UEN211

English II – ENVIRONMENTAL STUDIES

Upon completion of this course, the student will be able to:		PSO
CO 1	Define the scope of Environmental Science and identify the different types of natural resources.	1
CO 2	Define and identify the ecosystems and biodiversity around us.	1
CO 3	Analyze and assess the types of pollutions and social issues around us.	1
CO 4	Understand the impact of population on environment.	1

Course Code: 19UEN212.1

English III – ENGLISH GRAMMAR AND COMPOSITION

Upon completion of this course, the student will be able to:		PSO
CO 1	Define and identify the basis of grammar.	1
CO 2	Identify and explain the different types of sentences.	1
CO 3	Apply the rules of grammar in all situations of communication.	1
CO 4	Design written discourse.	1

Course Code: 19UFR/HN/ML 211.1

Additional Language II

19UFR211.1 - TRANSLATION & COMMUNICATION IN FRENCH

Upon completion of this course, the student will be able to:		PSO
CO 1	Analyze translated texts.	2
CO 2	Apply fine translation skills in the target language.	2
CO 3	Demonstrate better language proficiency with the assistance of translation.	2

19UHN211.1 - FICTION, SHORT STORY & NOVEL

Upon completion of this course, the student will be able to:		PSO
CO 1	Analyse various issues of Nationalistic outlook, Women empowerment and Dalit Chetana discussed in Hindi Novels & Short Stories.	2
CO 2	Develop essential skills of vocabulary enhancement & sentence structure.	2
CO 3	Realise human values as documented in literary texts.	2

19UML 211.1 - GADHYAM :RACHANAYUM PADAVUM

Upon completion of this course, the student will be able to:		PSO
CO 1	Understand different phases of Malayalam Prose.	2
CO 2	Demonstrate critical skills.	2
CO 3	Analyze the relation between Heritage and Culture.	2

Course Code: 19CH221

Foundation Course II – METHODOLOGY AND PERSPECTIVES OF SCIENCES AND GENERAL INFORMATICS

Upon completion of this course, the student will be able to:		PSO
CO 1	Understand methodology and perspectives of Science.	5
CO 2	Illustrate the history of evolution of chemistry as a major branch of science.	3
CO 3	Organise computer analysis and presentation of experimental data.	5
CO 4	Use analytical principles, safety measures and toxicity of chemicals.	4

Course Code: 19UMM231.2

Complementary Course III – CALCULUS WITH APPLICATIONS IN CHEMISTRY - II

Upon completion of this course, the student will be able to:		PSO
CO 1	Describe partial differentiation, properties and applications.	7
CO 2	Solve problems related to series, power series, Taylor series.	7
CO 3	Demonstrate vector differentiation, properties and its applications.	7
CO 4	Analyse multiple Integrals.	7

Course Code: 19UPH231.2

Complementary Course IV – THERMAL PHYSICS

Upon completion of this course, the student will be able to:		PSO
CO 1	Examine different heat engines and thermodynamic properties.	6
CO 2	Demonstrate skill to solve problems related to thermodynamic systems.	6
CO 3	Examine different ways of heat transfer, diffusion and its analysis.	6

SEMESTER III

Course Code: 19UEN311.1

English IV – READINGS IN LITERATURE I

Upon completion of this course, the student will be able to:		PSO
CO 1	Understand the various forms of Literature.	1
CO 2	Analyze the prose pieces of Indian authors.	1
CO 3	Evaluate the poems by Indian authors.	1
CO 4	Appraise short stories in English by Indian authors.	1

Course Code: 19UFR/HN/ML 311.1

Additional Language III

19UFR311.1 – LITERATURE IN FRENCH

Upon completion of this course, the student will be able to:		PSO
CO 1	Demonstrate knowledge of French and Francophone literature.	2
CO 2	Develop literary sensibility in French and Francophone literature.	2
CO 3	Interpret simple literary texts in French and thereby enrich one's vocabulary.	2

19UHN311.1 - POETRY AND GRAMMAR

Upon completion of this course, the student will be able to:		PSO
CO 1	Interpret the ideology of different Poets.	2
CO 2	Demonstrate positive approach towards nature & society.	2
CO 3	Analyse the features of Ancient, Medieval & Modern Poems.	2
CO 4	Apply the rules of grammar in all situations of communication.	2

19UML311.1 - DRISHYAKALA SAHITHYAM-BHAGAM 1

Upon completion of this course, the student will be able to:		PSO
CO 1	Develop critical view and creativity.	2
CO 2	Understand racial, gender and environmental issues.	2
CO 3	Analyze how language becomes a medium of culture.	2

Course Code:**Core Course II – INORGANIC CHEMISTRY II**

Upon completion of this course, the student will be able to:		PSO
CO 1	Explain basics of inorganic Chemistry and chemical bonding.	3
CO 2	Describe fundamental of nano science.	3
CO 3	Interpret various applications of nuclear chemistry.	5
CO 4	Discuss non-transition elements.	3

Course Code: 19UMM331.2**Complementary Course V – LINEAR ALGEBRA, PROBABILITY THEORY AND NUMERICAL METHODS**

Upon completion of this course, the student will be able to:		PSO
CO 1	Describe basics of Linear Algebra.	7
CO 2	Explain the laws of Probability and characteristics of various distributions.	7
CO 3	Use Numerical methods to solve algebraic, transcendental equations.	7
CO 4	Apply various of numerical integration and solve difference equations.	7

Course Code: 19UPH331.2

Complementary Course VI - OPTICS , MAGNETISM AND ELECTRICITY

Upon completion of this course, the student will be able to:		PSO
CO 1	Analyze and interpret interference, diffraction and polarization.	6
CO 2	Describe the principles and operations of laser and fibre optics.	6
CO 3	Explain magnetic materials, their properties, various electrical circuits including inductor, capacitor, resistor and their combinations	6

SEMESTER IV

Course Code: 19UEN411.1

English V – READINGS IN LITERATURE II

Upon completion of this course, the student will be able to:		PSO
CO 1	Critically analyze poetry in English.	1
CO 2	Understand and demonstrate the dynamics of theatre.	1
CO 3	Analyze prose pieces in English.	1
CO 4	Evaluate literature in the global context.	1

Course Code: 19UFR/HN/ML 411.1

Additional Language IV

19UFR411.1 – CULTURE AND CIVILIZATION

Upon completion of this course, the student will be able to:		PSO
CO 1	Identify the distinct features of French culture and civilization.	2
CO 2	Appraise role of cultural knowledge in learning a foreign language.	2
CO 3	Compare cultural practices as they relate to French and one's own culture.	2

19UHN411.1 - DRAMA, TRANSLATION & COMMUNICATIVE HINDI

Upon completion of this course, the student will be able to:		PSO
CO 1	Evaluate literary texts against the corresponding social backgrounds.	2
CO 2	Understand theory & practice of Translation.	2
CO 3	Develop skills of writing letters in official language Hindi.	2
CO 4	Develop communication skills in Hindi.	2

19UML411.1 - DRISHYAKALA SAHITHYAM- BHAGAM 2

Upon completion of this course, the student will be able to:		PSO
CO 1	Develop creative and critical skill.	2
CO 2	Analyze racial, gender and environmental Issues.	2
CO 3	Analyze Language as a medium of culture.	2

Course Code: 19UCH441**Core Course III – ORGANIC CHEMISTRY I**

Upon completion of this course, the student will be able to:		PSO
CO 1	Describe the chemistry of carbon molecules, various type of reactions, their mechanisms.	3
CO 2	Illustrate different types of reaction mechanisms.	3
CO 3	Identify the stereochemical representation of organic molecules.	5
CO 4	Describe cyclic compounds & their conformations and isomerism.	3
CO 5	Analyse photochemical reactions, colour and constitution of dyes and aromaticity.	3

Course Code:**Core Course V –**

Upon completion of this course, the student will be able to:		PSO
CO 1		
CO 2		
CO 3		
CO 4		

Course Code: 19UMM431.2

Complementary Course VII - DIFFERENTIAL EQUATIONS, VECTOR CALCULUS AND ABSTRACT ALGEBRA

Upon completion of this course, the student will be able to:		PSO
CO 1	Solve ordinary differential equations of first and higher orders.	7
CO 2	Evaluate line integrals, surface and volume integrals and their applications.	7
CO 3	Categorise groups and analyse their properties.	7

Course Code: 19UPH431.2

Complementary Course VIII - ATOMIC PHYSICS, QUANTUM MECHANICS AND ELECTRONICS

Upon completion of this course, the student will be able to:		PSO
CO 1	Describe various atom models and quantum numbers.	6
CO 2	Explain basics of superconductivity and basics of electronics.	6

SEMESTER V

Course Code: 19UCH541

Core Course V – PHYSICAL CHEMISTRY – I

Upon completion of this course, the student will be able to:		PSO
CO 1	Describe the physical principles governing chemical systems.	3
CO 2	Explain different states of matter.	3
CO 3	Describe gas and liquid properties and solve problems related problems.	5
CO 4	Apply group theory in chemical systems.	3
CO 5	Explain laws of thermodynamics as a tool to understand chemistry of bulk systems.	5

Course Code: 19UCH542

Core Course VI – INORGANIC CHEMISTRY – III

Upon completion of this course, the student will be able to:		PSO
CO 1	Explain inorganic chemistry, coordination chemistry, transition and inner transition elements.	3
CO 2	Describe multidisciplinary areas of bioinorganic chemistry and organometallic chemistry.	3
CO 3	Interpret transition metal chemistry.	5
CO 4	Demonstrate general principles of isolation and purification of elements, experimental techniques and instrumental methods of analysis.	3
CO 5	Identify the role of organometallic compounds in organic synthesis.	5

Course Code: 19UCH543

Core Course VII – ORGANIC CHEMISTRY – II

Upon completion of this course, the student will be able to:		PSO
CO 1	Describe preparation and properties, mechanism of reactions.	3
CO 2	Explain organic conversions of organic compounds.	3
CO 3	Illustrate principles of spectroscopy and spectral applications to organic molecules.	5
CO 4	Analyse organic compounds like alcohols, aldehydes, ketones, ethers, acids and their properties.	3

Course Code: 19UCH551.1

Open Course – ESSENTIALS OF CHEMISTRY

Upon completion of this course, the student will be able to:		PSO
CO 1	Explain structure of atoms and an understanding of the Periodic table.	3
CO 2	Describe the basics of nuclear chemistry.	3
CO 3	Describe industrially important polymers.	5
CO 4	Explain applications of chemistry in biology and in our daily life.	3
CO 5	Interpret environmental pollution.	5

SEMESTER VI

Course Code: 15UCH641

Core Course X – PHYSICAL CHEMISTRY – II

Upon completion of this course, the student will be able to:		PSO
CO 1	Explain the concepts of thermodynamics, quantum mechanics, and spectroscopy to chemical, physical, and biochemical systems.	3
CO 2	Interpret statistical thermodynamics.	3
CO 3	Describe chemistry at the microscopic level.	5
CO 4	Describe physical and chemical systems by non-spectroscopic techniques.	3
CO 5	Demonstrate mathematical relationships in thermodynamics, quantum mechanics and spectroscopy.	5

Course Code: 15UCH642

Core Course XI – ORGANIC CHEMISTRY PAPER – III

Upon completion of this course, the student will be able to:		PSO
CO 1	Describe preparation and properties of a wide variety of organic compounds.	3
CO 2	Explain polymers and their properties.	3
CO 3	Use reagents of synthetic utility.	5
CO 4	Explain the properties of organic compounds terpenes and alkaloids.	3

Course Code: 15UCH643

Core Course XII – PHYSICAL CHEMISTRY- PAPER III

Upon completion of this course, the student will be able to:		PSO
CO 1	Describe thermodynamic and kinetic aspects of chemical reactions and phase equilibrium.	3
CO 2	Use various electrochemical systems.	3
CO 3	Apply electrochemistry and its importance to modern industry and technology.	5
CO 4	Illustrate various types of reactions and the rate of chemical changes.	3
CO 5	Demonstrate phase diagrams of one, two and three component systems.	5

Course Code: 19UCH661.4

ELECTIVE COURSE – BIOCHEMISTRY

Upon completion of this course, the student will be able to:		PSO
CO 1	Understand human blood circulatory and respiratory systems.	3
CO 2	Describe the function of kidney.	3
CO 3	Explain different food items, their nutritional values and digestion.	3
CO 4	Interpret the chemical techniques used in biology.	3

