

FATIMA MATA NATIONAL COLLEGE

AUTONOMOUS

(Reaccredited with 'A' Grade by NAAC)

Affiliated to University of Kerala



OUTCOME MAPPING

IQAC INTERNAL QUALITY ASSURANCE CELL

BSc POLYMER CHEMISTRY

PROGRAMME OUTCOMES (POs)

PO 1	<p>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.</p>
PO 2	<p>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.</p>
PO 3	<p>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.</p>
PO 4	<p>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.</p>
PO 5	<p>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.</p>
PO 6	<p>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.</p>
PO 7	<p>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.</p>

PROGRAMME SPECIFIC OUTCOMES (PSOs)

The Department of Chemistry, Fatima Mata National College (Autonomous), Kollam, offers Three Year (comprising 6 semesters) Undergraduate Programme in Polymer Chemistry with the primary objective of equipping students to introduce to one of the most demanding field of Polymer Chemistry as an academic discipline. Upon successful completion of B. Sc. Polymer 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 Polymer 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	Solve problems in chemistry using concepts in optics and magnetism and thermodynamics, electronics and spectroscopy.

PSO – PO MAPPING

		POs						
PSOs		1	2	3	4	5	6	7
	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: 19UPO141**Core Course I – INORGANIC CHEMISTRY - I**

Upon completion of this course, the student will be able to:		PSO
CO 1	Explain the fundamental of atomic structure and properties	3
CO 2	Analyse mineral sands of Kerala.	3
CO 3	Describe interactions between the atoms leading to molecules and compounds.	4
CO 4	Identify the facts behind the nuclear reactors, atom bombs etc.	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	Demonstrate differentiation, integration and their applications	7
CO 2	Understand 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	Determine Young's modulus of various materials for beams	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: 19UPO221

Foundation Course II – METHODOLOGY AND INFORMATICS

Upon completion of this course, the student will be able to:		PSO
CO 1	Describe the concepts of perspectives of science and demonstrate experimentation & data handling.	4
CO 2	Discuss the evolution of chemistry and identify the importance of nanoscience and green science.	5
CO 3	Describe the concepts regarding Information Technology and designing of educational software.	5
CO 4	Recognise and estimate various inorganic compounds.	4
CO 5	Explain the safety measures in laboratory & identify the toxic chemicals.	5
CO 6	Understand the concept of chemi-informatics & its application.	5

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	Evaluate sum of various types of series, power series, Taylor series and properties.	7
CO 3	Explain vector differentiation, properties and applications.	7
CO 4	Evaluate 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	Solve problems on 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: 19UPO341**Core Course II – PHYSICAL CHEMISTRY I**

Upon completion of this course, the student will be able to:		PSO
CO 1	Explain the basic thermodynamic laws & its applications.	5
CO 2	Demonstrate the facts of statistical thermodynamics.	3
CO 3	Describe the concepts of chemical & ionic equilibrium.	5
CO 4	Identify the reaction kinetics & theory.	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: 19UPO441

Core Course III – ORGANIC CHEMISTRY I

Upon completion of this course, the student will be able to:		PSO
CO 1	Demonstrate the chemistry of carbon molecules, various type of reactions, their mechanisms & aromaticity.	3,5
CO 2	Identify the stereochemistry of organic compounds.	3
CO 3	Understand the chemistry of cyclic compounds & their conformations.	3
CO 4	Differentiate organic compounds based on their functional groups.	4

Course Code: 19UPO442

Core Course III – INORGANIC QUALITATIVE & VOLUMETRIC ANALYSIS

Upon completion of this course, the student will be able to:		PSO
CO 1	Sort & identify inorganic salts based on chemical analysis.	4
CO 2	Evaluate the concentration of various unknown solutions based on acidimetry, dichrometry, permanganometry etc.	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: 19UPO541

Core Course V – ORGANIC CHEMISTRY – II

Upon completion of this course, the student will be able to:		PSO
CO 1	Describe the preparation & properties of organic nitrogen & sulphur compounds.	3
CO 2	Explain the chemistry of carbohydrates, starch and cellulose.	5
CO 3	Discuss the importance of heterocyclic & organometallic compounds.	3
CO 4	Demonstrate the significance of alkaloids, terpenes and dyes.	5
CO 5	Describe the chemistry of steroids, vitamins, drugs & their significance	5
CO 6	Explain natural building materials, genetic engineering and the chemistry behind it.	5

Course Code: 19UPO542

Core Course VI – PHYSICAL CHEMISTRY – III

Upon completion of this course, the student will be able to:		PSO
CO 1	Explain the laws governing the physical & chemical behavior of substances in the gaseous, liquid, solution & solid state.	
CO 2	Describe, how the different phases of matter exist in equilibrium.	
CO 3	Demonstrate the theories & practice of electrochemistry.	

Course Code: 19UPO543

Core Course VII – POLYMER CHEMISTRY I

Upon completion of this course, the student will be able to:		PSO
CO 1	Describe the basic facts of polymer chemistry, history and evolution.	3
CO 2	Recognise the different types of polymerization mechanisms which lead to formation of polymers.	3
CO 3	Explain different polymerization techniques & assess the importance of copolymerization.	3
CO 4	Compute molecular mass by different techniques.	3

Course Code: 19UCH551

Open Course – CHEMISTRY IN EVERYDAY LIFE

Upon completion of this course, the student will be able to:		PSO
CO 1	Explain the concept of atoms and its bonding.	3
CO 2	Apply the importance of chemistry in biology and in our daily life.	5
CO 3	Recognise the chemistry of drugs, dyes, food preservatives, soaps and detergents.	5
CO 4	Describe the concepts of polymer chemistry, biodegradable polymers, recycling etc.	3,5
CO 5	Appraise the importance of keeping our environment clean.	5
CO 6	Explain the concepts of green and nano chemistry.	5

SEMESTER VI

Course Code: 15UPO641

Core Course X – INORGANIC CHEMISTRY – II

Upon completion of this course, the student will be able to:		PSO
CO 1	Describe the general characteristics of transition elements, Lanthanides and Actinides.	3
CO 2	Explain the concepts behind co-ordination compounds, their significance and group theory.	3
CO 3	Explain the chemistry of organometallic compounds and their applications.	5
CO 4	Illustrate non-aqueous solvents and describe various non-transition compounds.	3
CO 5	Justify the importance of bioinorganic compounds in biological systems.	5

Course Code: 15UPO642

Core Course XI – PHYSICAL CHEMISTRY – III

Upon completion of this course, the student will be able to:		PSO
CO 1	Explain the concepts of quantum mechanics and its classical treatment.	3,5
CO 2	Differentiate molecules based on various types of spectroscopy.	3,4
CO 3	Describe the concepts behind catalysis and photochemistry.	3
CO 4	Explain the theory of adsorption and colloidal state.	3

Course Code: 15UPO643

Core Course XII – POLYMER CHEMISTRY II

Upon completion of this course, the student will be able to:		PSO
CO 1	Explain the concepts of polymer structure and the critical importance of Tg and Tm.	3
CO 2	Describe various polymer reactions giving emphasis to vulcanization, SPPS etc.	3,5
CO 3	Compare the behavior of polymers in solutions.	3
CO 4	Understand polymer degradation procedures and the process of plastic waste management in environment.	5
CO 5	Identify biopolymers, bio degradable polymers and their importance in medical field.	5

Course Code: 15UPO644

Core Course XIII – GRAVIMETRY

Upon completion of this course, the student will be able to:		PSO
CO 1	Explain the concepts of gravimetric analysis.	4
CO 2	Analyse Ba, SO ₄ , Fe etc gravimetrically using silica crucible.	4
CO 3	Analyse Mg, Ni, Cu & Ag gravimetrically using sintered crucible.	4

Course Code: 15UPO645

Core Course XIV – PHYSICAL CHEMISTRY EXPERIMENTS

Upon completion of this course, the student will be able to:		PSO
CO 1	Explain the theoretical principles of physical chemistry experiments.	4
CO 2	Appraise partition coefficient, CST, Molar mass etc.	4
CO 3	Evaluate parachor value, hydrolysis kinetics and perform conductometric and potentiometric titrations for estimations.	4

Course Code: 19UPO661

ELECTIVE COURSE – ADVANCED POLYMER CHEMISTRY

Upon completion of this course, the student will be able to:		PSO
CO 1	Analyse polymers through different characterization techniques.	4
CO 2	Describe the significance of engineering plastics, polymer composites, smart polymers etc.	5
CO 3	Explain the general characteristics of elastomers and fibres.	3
CO 4	Identify various ingredients in polymer processing.	3
CO 5	Demonstrate different moulding techniques for production of articles.	3

Course Code: 15UPO646

PROJECT AND FACTORY VISIT

Upon completion of this course, the student will be able to:		PSO
CO 1	Design experiments to provide an answer to the question posed.	5
CO 2	Create research aptitude, research skills and inculcate a spirit of enquiry.	5

COURSE – PSO MAPPING

Courses	PSO 1	PSO 2	PSO 3	PSO 4	PSO5	PSO 6	PSO 7
19UEN111.1	*						
19UENS211	*						
19UFR111.1		*					
19UHN111.1		*					
CO N19UML 111.1		*					
19UPO141			*		*		
19UMM131.2						*	
19UPH131.2							*
19UENS211	*						
19UEN212.1	*						
19UFR211.1		*					
19UHN211.1		*					
19 UML 211.1		*					
19UPO221				*	*		
19UMM231.2						*	
19UPH231.2:							*
19UEN311.1	*						
19UEN311.2	*						
19UFR311.1		*					
19UHN311.1		*					
19 UML 311.1		*					
19UPO341			*				
19UMM331.2						*	
19UPH331.2							*
19UEN411.1	*						
19UFR411.1		*					
19UHN411.1		*					
19 UML 411.11		*					
19UPO441			*				
19UPO442				*			
19UMM431.2						*	
19UPH431.2							*
19UPO541			*		*		
19UPO542			*	*			
19UPO543			*				
19UPO551			*		*		
19UPO544				*			
19UPO545				*			
19UPO641			*		*		
19UPO642			*	*	*		
19UPO643			*		*		
19UPO661			*	*	*		
19UPO644				*			
19UPO645				*			
19UPO646					*		