

Pollachi

PG DEPARTMENT OF CHEMISTRY

SYLLABUS

2023-2025 Batch



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NGM COLLEGE (Autonomous)

Affiliated to Bharathiar University

Re-Accredited by NAAC & ISO 9001:2015 certified

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VISION

Establish a center of excellence for leading-edge Chemistry education. The main goal will be to produce highly skilled graduates capable of working in the rapidly changing scenario in the field of chemical science and technology during their lifetime.

MISSION

Impart quality education through up-to-date knowledge and information in the field of Chemistry related to science and technology and enable them to take up the challenge of the world to come.

was held at the campus. The detailed document is designed and the existing curriculum of the department is transformed in to the framework of OBE. This is the first step towards the implementation of OBE in the department. The document will serve all stakeholders in the effective implementation of the curriculum. The OBE is continuous process for quality enhancement and it will go a long way in order to enhance the competencies and employability of the Post-graduates of the department.

The M.Sc. Chemistry programme aims that the graduates will become successful professional by demonstrating rational and analytical thinking abilities. The graduates will be mould to communicate efficiently and work in interdisciplinary research and demonstrate scientific leadership in academia and industries.

Programme Educational Outcomes

PEO1	Mastering in concepts and problem solving: To understand major concepts, theoretical principles, experimental findings and the ability to employ them for critical thinking and efficient problem solving skills in different areas of Chemistry.
PEO2	Fostering Academic Ambitions: Be motivated to prepare the students to pursue higher studies and research to meet out academic demands of the country.
PEO3	Exploring Chemistry Techniques: Proficient in diverse chemistry techniques and their applications in scientific and engineering contexts.
PEO4	Stimulating Student Writing: Students will be stimulated to interchange their knowledge and skills for developing independent writing in their field of study.
PEO5	Empowering Responsible Graduates: Graduates will contribute to the growth of the nation and society as ethical and responsible professionals.

Programme Outcomes

After completion of the M.Sc. Chemistry Programme, the students must be able to

PO1	Disciplinary knowledge and skills: Capable of demonstrating (i) comprehensive knowledge and understanding of major concepts, theoretical principles and experimental findings in chemistry and its different subfields (analytical, inorganic, organic and physical), and other related fields of study, including broader interdisciplinary subfields such as life science, environmental science and material sciences; (ii) ability to use modern instrumentation for chemical analysis and separation.
PO2	Skilled communicator: Ability to transmit complex technical information relating to chemistry in a clear and concise manner in writing and orally skills.

PO3	Critical thinker and problem solver: Ability to employ critical thinking and efficient problem solving skills in the four basic areas of chemistry (analytical, inorganic, organic, and physical).
PO4	Sense of inquiry: Capability for asking relevant/appropriate questions relating to issues and problems in the field of chemistry, and planning, executing and reporting the results of an experiment or investigation.
PO5	Team player/ lifelong learners: Capable of working effectively in diverse teams in both classroom, laboratory and in industry and field-based situations as well as Capable of self-paced and self-directed learning aimed at personal development and for improving knowledge/skill development and reskilling.
PO6	Skilled project manager: Capable of identifying/mobilizing appropriate resources required for a project, and manage a project through to completion, while observing responsible and ethical scientific conduct; and safety and chemical hygiene regulations and practices.
PO7	Digital literacy: Capable of using computers for chemical simulation and computation and appropriate software for analysis of data, and employing modern library search tools to locate, retrieve, and evaluate chemistry-related information.
PO8	Ethical awareness/reasoning: Avoiding unethical behaviour such as fabrication, falsification or misrepresentation of data or committing plagiarism, and appreciate environmental and sustainability issues.

Programme Specific Outcomes

After completion of the M.Sc. Chemistry Programme, the students must be able to

PSO -01	Become Proficient in synthetic, analytical, electrochemistry, Phytochemistry, spectral techniques, characterization to develop interdisciplinary approach.
PSO -02	Develop new innovations in chemical, pharmaceutical and allied chemical industries and successfully implement them at an industrial scale.

Programme Code:	M.Sc			Programme Title:	Master of Chemistry		
Course Code:	22PCY310			Organic Chemistry –III – Natural Products and Organic Reagents		Batch:	2022 – 2024
						Semester:	III
Lecture Hrs./Week	5	Tutorial	-	Total Hrs/Sem	75	Credits:	5
Course Objective							
* To promote an awareness in the student about natural products and their synthesis.							
* To introduce new reagents available in organic synthesis.							
* To synthesize eco-friendly reagents and chemical pathways for the development of green chemistry.							

Course Outcomes

On the successful completion of the course, students will be able to

#	CO Statement	Knowledge Level
CO1	Comprehend the classes of natural products and the fundamental of condensation and molecular rearrangement reactions.	K2
CO2	Understand isolation, classification and structural elucidation of terpenoids, steroids and naming reactions which includes condensation, molecular rearrangements.	K2
CO3	Implement the biosynthetic idea of proteins and polypeptides.	K3
CO4	Apply the reagents inorganic synthesis.	K3
CO5	Predict the reagents involved inorganic synthesis and evaluate the structure and synthesis of heterocyclic compounds.	K5

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 – Evaluate

Mapping

PO / PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	M	M	H	M	H	L	L	L	H	H
CO2	M	M	H	M	L	L	L	M	H	H
CO3	M	H	H	H	H	M	M	M	H	M
CO4	H	H	H	H	H	M	H	M	M	H
CO5	H	H	H	M	H	M	M	M	M	M

H-High; M-Medium; L-Low

Programme Code:	M.Sc			Programme Title:	Master of Chemistry		
Course Code:	22PCY311			Physical Chemistry –III - Classical and Statistical Thermodynamics		Batch:	2022 – 2024
						Semester:	III
Lecture Hrs./Week	5	Tutorial	-	Total Hrs/Sem	75	Credits:	4
Course Objective							
* To understand and apply the concept of fugacity, activity and chemical potential.							
* To acquire knowledge on third law of thermodynamics and probability and ensembles.							
* To gain knowledge about the distribution laws (classical and statistical) and their applications.							

Course Outcome

On the successful completion of the course, students will be able to

#	CO Statement	Knowledge Level
CO1	Interpret the physical significance of chemical potential.	K2
CO2	Apply probability to molecular energy levels.	K3
CO3	Apply thermodynamic concepts to evaluate the relationship between thermodynamic properties.	K3
CO4	Comprehend the quantum statistics and partition function.	K4
CO5	Evaluate statistical thermodynamics to the properties of identical indistinguishable particles like electrons.	K5
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 – Evaluate		

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	H	M	H	M	M	M	M	M	M	M
CO2	M	H	M	H	M	M	M	M	M	M
CO3	H	M	H	M	H	H	H	H	M	-
CO4	H	M	H	H	M	H	H	H	H	M
CO5	M	H	M	H	M	H	M	M	H	H

H-High; M-Medium; L-Low

Programme Code:	M.Sc			Programme Title:	Master of Chemistry		
Course Code:	22PCY312			Organic Spectroscopy		Batch:	2022 – 2024
						Semester:	III
Lecture Hrs./Week	5	Tutorial	-	Total Hrs/Sem	75	Credits:	5
Course Objective							
* To enable the students to understand the principles and instrumentation of various spectroscopic techniques.							
* To acquire knowledge in the structural determination of unknown compounds using various spectroscopic methods.							
* To apply the spectral techniques in research and practical situations.							

Course Outcome

On the successful completion of the course, students will be able to

#	CO Statement	Knowledge Level
CO1	Apply and evaluate the UV/Vis spectroscopy as a qualitative and quantitative method.	K3,K5
CO2	Analyze the vibrations of molecules and identify the functional group present in it.	K4
CO3	Predict the structure of compound using 1D and 2D NMR techniques.	K5
CO4	Assess the mass to charge ratio for the sample under test and to propose the fragmentation pattern.	K5
CO5	Able to identify an unknown organic compound using the spectroscopic principles.	K5
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 – Evaluate		

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	H	H	H	M	H	-	-	M	H	H
CO2	M	H	H	H	H	L	M	-	H	H
CO3	H	H	H	H	H	-	-	M	H	H
CO4	H	H	H	H	M	-	-	L	M	H
CO5	H	H	H	H	H	L	L	H	H	H

H-High; M-Medium; L-Low

Programme Code:	M.Sc			Programme Title:		Master of Chemistry	
Course Code:	22PCY3E4			*Major Elective –II - Organometallic Chemistry		Batch:	2022 – 2024
						Semester:	III
Lecture Hrs./Week	3	Tutorial	-	Total Hrs/Sem	45	Credits:	3

Course Objective

- Learn about the development of organometallic chemistry and types of bonds in organometallic complexes
- Learn about the important organometallic complexes and their applications in various organic transformations as homogeneous/ heterogeneous catalysts
- Recognition of organometallic chemistry in Noble Prize for chemistry in 2001, 2005 and 2010
- To apply organometallic chemistry principles to research for new compound synthesis

Course Outcomes (CO)

On the successful completion of the course, students will be able to

#	Course Outcomes (CO)	Knowledge Level
CO1	Understand the historical development of Organometallic chemistry and uniqueness in various bonding behaviour of organometallic compounds.	K2
CO2	Gaining the knowledge on metal carbonyl compounds, various types of insertion reactions in carbonyl chemistry and their applications	K4,K2
CO3	Organometallic alkyl, alkylidene and alkylidyne, alkene and alkyne chemistry and application of them in insertion, double carbonylation, olefin metathesis, hydrogenation, hydrosilation, oxidation and polymerisation reactions.	K4,K2
CO4	To synthesis and understand metallocenes, half-sandwich complexes, arene complexes and multidecker complexes.	K4
CO5	Inferring the importance of metallocene chemistry and the applications of metallocenes in stereospecific polymerisation of 1-alkenes and fluxional behaviour of π -electron systems and importance of organometallic chemistry in catalysis and recognition of Noble prizes 2001, 2005 and 2010.	K6

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** – Evaluate

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	H	H	H	M	H	M	H	H	H	-
CO2	H	H	H	M	M	M	H	L	H	M
CO3	H	H	H	H	H	M	H	H	M	-
CO4	H	H	H	H	H	L	H	H	H	-
CO5	H	H	H	H	M	M	M	M	M	-

H-High; M-Medium; L-Low

Programme code:	M.Sc.			Programme Title :		Master of Chemistry	
Course Code:	22PCY3E5			*Major Elective –II –Nanoscience and Nanotechnology		Batch :	2022 – 2024
						Semester:	III
Lecture Hrs./Week	3	Tutorial Hrs./Sem.	-	Total Hrs./Sem	45	Credits:	3
Course Objective							
* Origin and the basics of nanoscience and technology with relevance to biology and medicine.							
* The various methods available for preparation of nano structured materials and their applications							
* The role of nanomaterials and their properties in advancing different areas of biology and medicine							

Course Outcomes

On the successful completion of the course, student will be able to:

#	Course Outcomes (CO)	Knowledge Level
CO1	Demonstrate the various nanoparticles process methods.	K2
CO2	Understand the role of various methods of preparation of Nanomaterials.	K2
CO3	Appreciate the plasmonic properties of nanomaterials	K3
CO4	Interpret the magnetic properties of nanomaterials	K4
CO5	Predict the major properties of nano objects such as nanotubes, quantum dots and nanoparticles.	K5
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 – Evaluate		

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	H	H	H	M	H	M	H	H	H	H
CO2	H	H	H	M	M	M	H	M	H	H
CO3	H	H	H	H	H	M	H	H	M	H
CO4	H	H	M	H	H	M	H	H	H	H
CO5	H	H	M	H	M	M	M	M	M	H

H-High; M-Medium; L-Low

Programme Code:	M.Sc			Programme Title:	Master of Chemistry		
Course Code:	22PCY3E6			Major Elective –II: Dye Chemistry		Batch:	2022 – 2024
						Semester:	III
Lecture Hrs./Week	3	Tutorial Hrs./	-	Total Hrs/Sem	45	Credits:	3
Course Objective							
* To understand the chemistry of dyes.							
* To interpret the various types of dyes, synthesis, reactions and applications.							
* To recognize the pigments, cosmetics and coloring agents.							

Course Outcomes

On the completion of the course the student will be able to

#	CO Statement	Knowledge Level
CO1	Learnt the chemistry of dyes.	K3
CO2	Studied the organic intermediate in the dye chemistry.	K4
CO3	Interpret the various types of dyes, synthesis, reactions and applications.	K5
CO4	Expertise in the pigments, cosmetics and colouring agents.	K5
CO5	Synthesize new variety of Dyes.	K5
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 – Evaluate		

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02
CO1	H	H	M	H	H	M	H	M	H	H
CO2	H	M	H	H	H	H	M	H	H	H
CO3	M	H	H	H	H	H	H	H	H	H
CO4	H	M	H	H	H	H	M	H	H	H
CO5	H	H	H	M	H	M	H	H	H	H

H-High,

M-Medium,

L-Low

Programme Code:	M.Sc			Programme Title:	Master of Chemistry		
Course Code:	22PCY3AL			Applied Chemistry (Optional)	Batch:	2022 – 2024	
					Semester:	III	
Lecture Hrs./Week	-	Tutorial	-	Total Hrs/Sem	-	Credits:	Grade
Course Objective							
* To understand the chemistry of dairy and leather processing.							
* To acquire knowledge about ceramic products and lubricants.							
* To learn about explosives and rocket fuels.							

Course Outcomes

On the completion of the course the student will be able to

#	CO Statement	Knowledge Level
CO1	list the properties of milk & predict the quality	K1
CO2	explain the different steps in leather processing and analyze the effluent problems in tanneries	K3
CO3	Use your understanding for the production of manufacturing of ceramic products	K4
CO4	Design and synthesis lubricants with enhanced properties and performance	K4
CO5	Utilize your skills to assess the quality of milk, create leather, and produce the essential raw materials for the ceramics industry.	K5
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 – Evaluate		

Mapping

PO / PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	H	H	H	H	H	H	H	H	H	H
CO2	H	H	M	H	H	H	H	H	H	H
CO3	H	H	H	H	H	H	H	H	H	H
CO4	H	H	M	H	M	H	H	H	H	H
CO5	H	H	H	M	M	H	H	H	H	M

H-High; M-Medium; L-Low

Programme Code:	M.Sc			Programme Title:	Master of Chemistry		
Course Code:	22PCY413			Inorganic Chemistry –III: Bioinorganic Chemistry	Batch:	2022 - 2024	
					Semester:	IV	
Lecture Hrs./Week	5	Tutorial	-	Total Hrs/ Sem	75	Credits:	5
Course Objective							
* To understand the key role of various elements in the living systems.							
* To acquire knowledge in the nature, preparation and properties metal carbonyl complexes, photochemistry of metal complexes.							
* To gain insight into the small molecules binding and transport mechanism involving metalloenzymes.							
* To know about the mechanism of binding interactions of metal complexes with bio-molecules and metal based drug action.							

Course Outcomes

On the completion of the course the student will be able to

#	CO Statement	Knowledge Level
CO1	Analyze the various biological roles such as metal ion transport and storage, electron.	K4
CO2	Knowledge about the medically- metal in medicine, interaction of metal ions with biomolecules.	K2
CO3	Acquire intense knowledge about various biological roles such as metal ion transport and storage, electron- and proton transfer, O ₂ transport, hydrolysis, etc. taking place at the active site of metalloproteins.	K4
CO4	Gain knowledge about the medically-important topics such as the toxicity of metal ions, and their uses, Ru and Pt complexes in cancer therapy. This would motivate the students to pursue their research in the field of medicinal chemistry.	K3
CO5	Interpretation of bioinorganic chemistry to crack the competitive examinations.	K5
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate		

Mapping

PO / PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	H	M	H	H	M	H	M	M	H	L
CO2	M	H	M	H	M	-	L	M	M	-
CO3	H	M	H	H	H	M	H	H	L	-
CO4	H	M	H	H	M	-	M	H	H	H
CO5	M	H	M	H	M	-	M	M	H	H

H-High; M-Medium; L-Low

Programme Code:	M.Sc			Programme Title:		Master of Chemistry	
Course Code:	22PCY414			Instrumental Methods of Chemical Analysis		Batch:	2022 – 2024
						Semester:	IV
Lecture Hrs./Week	5	Tutorial	-	Total Hrs/ Sem	75	Credits:	4
Course Objective							
* To study the various types of errors and their correlations.							
* To enable the students to attain knowledge on various chromatographic techniques and thermo analytical methods.							
* To gain knowledge in ESR, Mossbauer spectroscopy and AAS, AES, Polarimetry and Photo Electron Spectrometry.							
* To acquire knowledge about the configuration and confirmation of organic molecules by ORD and CD.							

Course Outcomes (CO)

On the successful completion of the course, students will be able to

#	Course Outcomes (CO)	Knowledge Level
CO1	Classify thermo analytical techniques and to assess the thermal stability of a chemical compound.	K2
CO2	Comprehend the basic principle, instrumentation and applications of various chromatographic techniques, thermal analysis.	K2
CO3	Apply data analysis, various chromatographic techniques to separate the compounds, electron spin resonance and Mossbauer spectroscopy in the field of research.	K3
CO4	Evaluate the basic principle, instrumentation and applications of photoelectron spectroscopy, AAS, FES and Polarimetry.	K5
CO5	Interpret the data in chemical analysis.	K5
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate		

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	H	H	H	H	H	M	M	H	H	-
CO2	H	H	H	M	H	M	-	H	H	-
CO3	H	H	H	H	H	M	L	H	H	-
CO4	H	H	M	M	H	L	M	H	H	-
CO5	H	H	H	H	M	M	H	H	H	-

H-High; M-Medium; L-Low

Programme Code:	M.Sc.,			Programme Title:	Master of Chemistry		
Course Code:	22PCY4E7			*Major Elective –III Phytochemical Techniques and Health Chemistry	Batch:	2022 – 2024	
						Semester:	IV
Lecture Hrs./Week	3	Tutorial Hrs./Sem.	-	Total Hrs/ Sem	45	Credits:	3

Course Objective

- * To enable post graduate students in Chemistry to gain knowledge on phyto chemical techniques.
- * To enable them to be familiar with techniques of extraction, separation and purification and simple identification strategies of drugs/natural products.
- * To acquaint with health and hygiene food system along carbohydrates and vitamins.
- * To learn the mode of mechanism for common diseases.

Course Outcomes

On the successful completion of the course, students will be able to

#	CO Statement	Knowledge Level
CO1	Understanding on necessity and role of carbohydrates and vitamins for humans.	K2
CO2	Remember the phytochemical techniques -extraction, separation and purification.	K5
CO3	Implement the basic values and analyze the functions of food, food pyramid and hygiene food system.	K5
CO4	Evaluate the mechanism for biological function of carbohydrates and vitamins.	K4
CO5	Analyze the mechanism and causes of common diseases.	K5
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 – Evaluate		

Mapping

PO / PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	M	M	H	M	H	M	H	H	M	M
CO2	H	M	H	M	H	M	M	M	M	H

CO3	H	M	H	M	H	H	H	M	M	H
CO4	H	H	M	H	M	M	M	M	M	H
CO5	H	H	H	H	H	H	H	H	M	H

H-High; M-Medium; L-Low

Programme Code:	M.Sc			Programme Title:		Master of Chemistry	
Course Code:	22PCY4E8			Major Elective III – Computational Chemistry		Batch:	2022 – 2024
						Semester:	IV
Lecture Hrs./Week	3	Tutorial	-	Total Hrs/Sem	45	Credits:	3
Course Objectives							
* To Draw Chemical structures by Chemdraw and graphs by Origin.							
* To gain knowledge about various computational tools and methods.							
* To learn Gaussian and DFT studies.							

Course Outcome**On the successful completion of the course, students will be able to**

#	CO Statement	Knowledge Level
CO1	Know the available free databases like MOL, SMILES.	K2
CO2	Draw the chemical structure and graphs using Chemdraw and Origin.	K3
CO3	Gain the theoretical knowledge about Slater and Gaussian functions.	K3
CO4	Evaluate the molecular mechanics, abinitio, semi empirical and DFT studies.	K5
CO5	Calculate the optimization studies for various molecules.	K5
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 – Evaluate		

Mapping

PO / PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	H	H	H	M	H	H	M	H	M	H
CO2	H	H	H	H	H	H	M	M	H	H
CO3	H	H	H	M	-	H	H	M	M	M
CO4	H	M	M	H	-	M	-	M	M	M
CO5	H	H	H	H	H	H	H	H	M	H

H-High; M-Medium; L-Low

Programme Code:	M.Sc			Programme Title:		Master of Chemistry	
Course Code:	22PCY4E9			*Major Elective –III - Green Chemistry		Batch:	2022 - 2024
						Semester:	IV
Lecture Hrs./Week	3	Tutorial	-	Total Hrs/Sem	45	Credits:	3
Course Objective							
* To understand the basic principles and importance of green chemistry for industrial applications.							
* To acquire knowledge about the microwave and ultra sound assisted synthesis.							
* To understand the concept of phase-transfer catalysis.							
* To gain knowledge about ionic liquids, Crown ethers and their applications.							

Course Outcomes (CO)

On the successful completion of the course, students will be able to

#	Course Outcomes (CO)	Knowledge Level
CO1	Define green chemistry and explain basic principles.	K2
CO2	Discuss and appraise green reagents, microwave and ultrasound assisted Synthesis.	K2
CO3	Analyse the synthetic applications and advantages of ionic liquids.	K4
CO4	Appraise the advantages and the applications of phase transfer catalyst in organic synthesis.	K5
CO5	Propose Crown ethers for various reactions.	K5
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 – Evaluate		

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	H	H	H	M	H	M	H	H	H	H
CO2	H	H	H	M	M	M	H	L	H	M
CO3	H	H	H	H	-	M	H	H	M	H
CO4	H	H	H	H	H	L	H	H	H	H
CO5	H	H	H	H	-	M	M	M	M	M

H-High; M-Medium; L-Low

Programme Code:		M.Sc			Programme Title:			Master of Chemistry	
Course Code:		22PCY415			Inorganic Chemistry Practical –II			Batch:	2022 - 2024
								Semester:	III & IV
Lecture Hrs./Week	III Sem	4	Tutorial	-	Total Hrs/ Sem	III	60	Credits:	4
	IV Sem	5				IV	75		
Course Objective									
* To analyse quantitatively the metal ions such as Cu, Ni, Fe, Zn, Ca and Ba in a mixture.									
* To estimate quantitatively Magnesium, Calcium and Zinc by complexometry.									
* To separate the components in ink and flowers by Chromatography.									

Course Outcomes

On the completion of the course the student will be able to

#	CO Outcomes	Knowledge Level
CO1	Separate and estimate the metal ions in a mixture.	K5
CO2	Estimate the metal ions in complexes.	K4
CO3	Separate the components in natural and commercial products.	K4
CO4	Estimation of various inorganic ions.	K5
CO5	Distinguish the chromatographic techniques.	K4
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 – Evaluate		

Mapping

PO / PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	H	M	H	H	M	-	M	M	H	M
CO2	H	H	H	M	H	-	M	M	H	M
CO3	H	H	H	H	H	-	H	M	H	H

Programme Code:		M.Sc			Programme Title:			Master of Chemistry	
Course Code:		22PCY416			Organic Chemistry Practical –II			Batch:	2021 – 2023
								Semester:	III & IV
Lecture Hrs./Week	III Sem	4	Tutorial	-	Total Hrs/ Sem	III	60	Credits:	4
	IV Sem	5				IV	75		
Course Objective									
* To estimate organic compounds quantitatively.									
* To learn and practice the methods of preparation of some organic compounds.									
* To understand some chromatographic techniques.									

Course Outcomes

On the completion of the student will be able to

#	Course Outcomes	Knowledge Level
CO1	Remember and practice aromatic substitution reactions and the basic principles of various chromatographic techniques.	K2, K4
CO2	Understand and evaluate the estimation of phenol, aniline, ketone and glucose.	K4
CO3	Estimate certain natural products and separate the compounds using chromatographic technique.	K5
CO4	Test the different types of chemical constituents in plant extracts.	K4
CO5	Furnish the pupil to estimate the adulteration level in the oil.	K4
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 – Evaluate		

Mapping

PO/PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO										
CO1	H	H	H	H	H	H	M	H	H	H
CO2	H	M	H	H	M	H	M	H	H	H
CO3	M	M	H	H	L	-	-	-	H	H
CO4	H	H	H	H	H	H	H	H	H	H
CO5	M	M	H	H	L	-	M	-	H	H

H-High; M-Medium; L-Low

Programme code:		M.Sc.		Programme Title :			Master of Chemistry		
Course Code:		22PCY417		Physical Chemistry Practical –II			Batch :	2022-2024	
							Semester	III & IV	
Lecture Hrs/Week:	III Sem	4	Tutorial :	-	Total Hrs/Sem:	III	60	Credits:	4
	IV Sem	5				IV	75		
Course Objective									
* To equip the future chemist with the knowledge of electrical conductance measurement, kinetics, UV visible spectrometer and conductometric titrations.									
* To learn maintain the record observations on conductometric titrations and chemical kinetics and ability to use various instruments.									

Course Outcomes (CO)

On the successful completion of the course, students will be able to

#	Course Outcomes (CO)	Knowledge Level
CO1	Acquire knowledge about conductometric titration, fundamentals of adsorption, metal ligand ratio and the acid hydrolysis of ester.	K2
CO2	Understand various laws of electrochemistry and applications of electrical conductance measurements and the applications of chemical kinetics.	K3
CO3	Determine the cell constant and verify the Debye-Huckel Onsager equation and Kohlrausch's law.	K5
CO4	Determine the relative strength of acids and rate of reaction.	K5
CO5	Estimate the amount of ions conductometrically and evaluate the amount of oxalic acid adsorbed using charcoal as adsorbent.	K6
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 – Evaluate		

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	H	H	H	H	H	H	H	H	H	H
CO2	H	M	H	H	M	H	H	H	H	M
CO3	H	H	M	H	H	M	H	M	M	H
CO4	M	H	H	M	H	H	H	H	H	H
CO5	H	H	M	H	H	M	-	-	M	H

H-High; M-Medium; L-Low

Programme code:	M.Sc.		Programme Title :			Master of Chemistry	
Course Code:	22PCY4P1		Project Work & Viva-Voce			Batch	2022-2024
						Semester	IV
Lecture Hrs/Week:	-	Tutorial	-	Total Hrs/Sem	-	Credits:	5
Course Objective							
* Make the students to understand the importance of experimental analysis, scientific approach in solving problems related to the environment and society.							
* Educate and train the students to write scientific papers.							

Course Outcomes (CO)

On the successful completion of the course, students will be able to

#	Course Outcomes (CO)	Knowledge Level
CO1	Apply the various preliminary skills in laboratory.	K3
CO2	Analyze the various sources of literature review.	K4
CO3	Evaluate the various techniques from the previous studies.	K5
CO4	Apply the suitable parameters in the project work.	K5
CO5	Synthesis the various organic, nano and co-ordination compounds	K6
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 – Evaluate		

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	H	H	H	H	H	H	M	H	H	H
CO2	H	M	H	H	M	H	M	H	H	H
CO3	M	M	H	H	L	-	-	-	H	H
CO4	H	H	H	H	H	H	H	H	H	H

H-High; M-Medium; L-Low

**VALUE ADDED
COURSES**

Programme code:	M.Sc.	Programme Title :		Master of Chemistry	
Course Code:	22PCY2VA	Value added course Entrepreneurial Ventures in Chemistry		Batch	2022-2024
				Semester	II / IV
Lecture Hrs/Week:	2	Total Hrs/Sem	30	Credits:	2

Course Objectives

- * To provide knowledge of household products to address the needs of chemical industry.
- * Able to synthesize house hold Cleaning agents, formulation of cosmeceuticals and hygiene products.
- * To enhance student sense of enthusiasm for chemistry and to involve them in an intellectually stimulating experience of learning in a supportive environment.
- * To impart knowledge on marketing approaches on studying consumer need, need gaps and global markets.

Employability

- * To provide worldwide opportunity to study household products.
- * Students have the opportunity to undertake an optional placement and enhance their entrepreneur skill by offering valuable experience.

Advantages

Students will be familiar with the different exposure of chemicals used in day to day life such as Cleaning agents, surfactants and Insect repellent one can design and practice ecofriendly cosmetics of their own.

Course Outcomes

- * To acquire basic information about the possibilities and limitations of household products, their importance and marketing.
- * To familiarize the authorized ingredients for household products, their origin, chemical nature and importance.
- * Develop new innovations in Chemical, pharmaceutical, cosmetics and allied chemical industries and successfully implement them at an industrial scale.
- * Hands on experience for manufacturing industries.

Programme code:	M.Sc.	Programme Title :		Master of Chemistry	
Course Code:	22PCY4VA	Value added course Analytical techniques		Batch	2022-2024
				Semester	II / IV
Lecture Hrs/Week:	2	Total Hrs/Sem	30	Credits:	2
Scope					
* This course will train participants with the knowledge and skills required for success in the practical operation of Volumetric analysis					
* This course is designed to expertise regulations governing Analytical techniques for using various industries.					

Course Objectives
Upon completion, the participant should be able to:
* To enable the students to attain knowledge on various chromatographic techniques.
* To gain knowledge in Volumetric Analysis and Chromatographic techniques.
Employability
* Graduates will be qualified to work in Chromatographic techniques as operators to the expected industry standard.
* Students have the opportunity to undertake an optional placement and enhance their entrepreneur skill by offering valuable experience.
Advantages
* To apply the various analytical techniques for industrial purposes.

Course Outcomes
* Classify chromatographic techniques and to assess the separation techniques of a chemical compound.
* Comprehend the basic principle, instrumentation and applications of various chromatographic techniques.
* Analyze the various methods involved in analytical techniques.
* Apply the various chromatographic techniques to separate the compounds in the field of research.



Programme code:	M.Sc.			Programme Title :	MSc Chemistry
Course Code:	CERTIFICATE COURSE-I			Batch	2022-2024
22PCYCFC01	Fundamentals of Pharmaceutical Chemistry			Semester:	III
				Credits:	2
Lecture Hrs/Week	2	Tutorial	-	Total Hrs/Sem:	40
Course Objectives:					
* To compete during their search for jobs in the pharmaceutical companies.					
* To acquire the knowledge about medicinal plants and medicinally important compounds.					
* To recognize the importance of Antibiotics, sulphadruugs, Analgesics.					
* To analyze the Antipyretics, Antihypertensive, hypotensive and antineoplastic drugs.					

Course Outcomes (CO)

On the successful completion of the course, students will be able to

#	CO Outcomes	Knowledge Level
CO1	Acquire knowledge about the important terminologies used in pharmaceutical chemistry, naming of drugs and mechanism of drug action.	K2
CO2	Learn about medicinal plants and medicinally important compounds.	K4
CO3	Recognize the importance of Blood, receptor and drug design.	K5
CO4	Analyze the Antipyretics, Antihypertensive, hypotensive and antineoplastic drugs.	K4
CO5	Explain receptors and drug design	K5
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 – Evaluate		

Programme Code:	M.Sc			Programme Title:		Master of Chemistry	
Course Code:	23PCY101			Inorganic Chemistry –I- Solid State and Nuclear Chemistry		Batch:	2023 - 2025
						Semester:	I
Lecture Hrs./Week	4	Tutorial	1	Total Hrs/ Sem	75	Credits:	4

Course Objectives

- * To gain knowledge in solid state Chemistry.
- * To emphasize the significance of crystallographic properties and description of crystal structures.
- * To acquire awareness about the defects in crystal structure and its effect in electrical properties
- * Ability to know the principle of nuclear model, application of radioactive counting techniques and radioactive isotopes.

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcomes (CO)	Knowledge Level
CO1	Student will know through knowledge about the structural properties of chains, cages and metal clusters.	K2
CO2	Student will understand the various types of close packing arrangements of different solid structures.	K2
CO3	Distinguish the types of solids, their defects and electrical properties of solids.	K4
CO4	Evaluate n/p ratio, binding energy and Q-value of nuclear reactions.	K4
CO5	Apply the nuclear chemistry principles and its application in various fields.	K5
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 – Evaluate		

Mapping

PO / PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO										
CO1	M	H	H	H	M	L	M	M	H	M
CO2	M	H	M	H	M	-	L	M	H	H
CO3	H	M	H	M	H	M	H	H	H	M
CO4	H	M	H	H	M	-	M	H	M	M
CO5	H	H	M	M	M	-	M	M	H	-

H-High; M-Medium; L-Low

Programme Code:	M.Sc			Programme Title:	Master of Chemistry		
Course Code:	23PCY102			Organic Chemistry–I- Organic Reaction Mechanisms		Batch:	2023 – 2025
						Semester:	I
Lecture Hrs./Week	4	Tutorial	1	Total Hrs/Sem	75	Credits:	5
Course Objectives							
* To understand the aromaticity of organic molecules and reaction mechanisms.							
* To provide knowledge about electrophilic, nucleophilic substitution and elimination reactions.							
* To learn about the basic concept about organic reaction intermediates.							

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcomes (CO)	Knowledge Level
CO1	Understand the aromaticity of compounds and develop skills for identifying the kinetics of reactions.	K2
CO2	Explain the mechanism of different types of substitution, addition and elimination reactions for synthesizing organic compounds.	K3
CO3	Apply the mechanisms in solving chemical reactions.	K3
CO4	Inspect the different types of reactions involved in chemical synthesis and various naming reactions.	K4 & K5
CO5	Evaluate the various types of reaction mechanisms.	K5
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 – Evaluate		

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	H	-	H	H	H	-	H	H	M	M
CO2	H	H	M	H	H	H	H	H	H	H
CO3	M	H	H	H	M	H	H	M	H	H
CO4	H	H	M	H	H	M	H	H	M	H
CO5	H	-	H	H	H	H	H	H	H	H

H-High; M-Medium; L-Low

Programme Code:	M.Sc			Programme Title:	Master of Chemistry		
Course Code:	23PCY103			Physical Chemistry –I – Group Theory and Chemical Kinetics		Batch:	2023 - 2025
						Semester:	I
Lecture Hrs./Week	4	Tutorial	1	Total Hrs/Sem	75	Credits:	5
Course Objective							
* To gain knowledge on basic and applications of group theory.							
* To learn about rate and order of the various reactions.							
* To understand the concepts of catalysis, adsorption and its mechanisms.							

Course Outcomes (CO)

On the successful completion of the course, students will be able to

#	Course Outcomes (CO)	Knowledge Level
CO1	Summarize the fundamentals of group theory and the fundamental concepts on kinetics and reaction rate.	K2
CO2	Develop knowledge on applications of group theory and various theories of chemical kinetics.	K3
CO3	Predict the IR and Raman active vibration modes for molecules and type of hybridization in nonlinear molecules based on group theory.	K3
CO4	Analyze the use of the kinetics and theories of surface chemistry.	K4
CO5	Examine hybridization scheme for orbital in simple molecules.	K5
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 – Evaluate		

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	H	M	-	-	-	-	H	H	-	-
CO2	H	H	M	M	M	-	-	-	M	L
CO3	H	H	H	H	H	M	L	M	M	L
CO4	H	H	M	M	H	L	M	M	H	M
CO5	H	H	M	M	M	L	M	L	M	-

H-High; M-Medium; L-Low

Programme code:	M.Sc			Programme Title :		Master of Chemistry	
Course Code:	23PCY204			Inorganic Chemistry - II Coordination Chemistry		Batch :	2023-2025
						Semester	II
Lecture Hrs./Week	4	Tutorial	1	Total Hrs/ Sem	75	Credits:	4
Course Objectives							
* Acquire knowledge about theories of complexes, basics of electronic spectroscopy of transition metal complexes, mode of coordination with various geometries.							
* To apply the knowledge of coordination chemistry to research and analyze the term symbols.							
* Realize the importance of the important inorganic polymers and their applications.							

Course Outcomes (CO)

On the successful completion of the course, students will be able to

#	Course Outcomes (CO)	Knowledge Level
CO1	Understand the various concepts of coordination chemistry and realize the importance of electronic spectroscopy and magnetic properties of coordination compounds.	K2
CO2	Gaining the knowledge on various types of inorganic reaction mechanism in different geometries.	K2
CO3	Acquiring knowledge on various types of electron transfer mechanism of metal complexes and their importance.	K3
CO4	Inferring various symmetries/geometries of coordination complexes and their isomerism and important applications of some inorganic polymers.	K4
CO5	Prepare some important coordination complexes as catalyst for reactions.	K5
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate		

Mapping

PO/PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PS01	PS02
CO										
CO1	H	-	H	H	H	-	H	H	M	M
CO2	H	H	M	H	H	H	H	H	H	H
CO3	M	H	H	H	M	H	H	M	H	H
CO4	H	H	M	H	H	M	H	H	M	H
CO5	H	-	H	H	H	H	H	H	H	H

H-High; M-Medium; L-Low

Programme Code:	M.Sc			Programme Title:	Master of Chemistry		
Course Code:	23PCY205			Organic Chemistry –II – Organic Reactions and Stereochemistry		Batch:	2023 - 2025
						Semester:	II
Lecture Hrs./Week	4	Tutorial	1	Total Hrs/Sem	75	Credits:	5
Course Objective							
* To give a thorough introduction to the study of Oxidation, Reduction and alkaloids.							
* To know the concept of Organic Photochemistry.							
* To enable a comprehensive knowledge on conformational Stereochemistry and Pericyclic reactions.							

Course Outcomes

On the successful completion of the course, students will be able to

#	CO Statement	Knowledge Level
CO1	Comprehend the basic of oxidation and reduction reactions and photochemistry.	K2
CO2	Outline the importance of pericyclic reactions, to figure out isomerism and conformational analysis of stereochemistry and to understand the structural elucidation of alkaloids.	K2
CO3	Implement the basic values and analyze the functions of the natural product such as alkaloids.	K3
CO4	Analyze the reagents in chemical reactions, to execute photochemical and pericyclic reactions.	K4
CO5	Evaluate the stereo chemical isomerization, configuration and conformations of molecules.	K5
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 – Evaluate		

Mapping

PO / PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	M	M	H	H	M	M	M	M	M	M
CO2	H	H	H	H	H	M	M	H	H	H
CO3	H	H	H	H	H	M	M	H	H	M
CO4	M	H	H	H	H	H	H	H	M	H
CO5	H	H	H	M	H	M	M	H	M	M

H-High; M-Medium; L-Low

Programme Code:	M.Sc			Programme Title:	Master of Chemistry		
Course Code:	23PCY206			Physical Chemistry –II - Quantum Chemistry and Nano Chemistry	Batch:	2023 – 2025	
					Semester:	II	
Lecture Hrs./Week	4	Tutorial	1	Total Hrs/Sem	75	Credits:	4
Course Objective							
* To motivate the students to comprehend knowledge in quantum mechanics.							
* To apply the quantum mechanical concept to simple molecules and experiment approximation methods.							
* To appraise the practical applications of nano material synthesis techniques.							

Course Outcomes (CO)

On the successful completion of the course, students will be able to

#	CO Statement	Knowledge Level
CO1	Understand the failure of classical mechanics and formulation of quantum mechanics.	K2
CO2	Solve the Schrödinger wave equation for simple systems	K4
CO3	Comprehend the approximate methods in quantum mechanics and apply it to simple molecules	K5
CO4	To understand and analyze nano material synthetic strategy for various applications.	K3
CO5	Realize the practical applications of designing and synthesizing nano materials.	K3
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 – Evaluate		

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	H	H	M	H	M	-	M	M	H	H
CO2	H	H	H	L	H	-	L	M	L	H
CO3	H	H	H	H	M	M	H	H	H	M
CO4	H	H	H	M	H	-	H	M	-	-
CO5	H	H	H	M	H	M	H	H	H	H

H-High; M-Medium; L-Low

Programme Code:	M.Sc			Programme Title:	Master of Chemistry		
Course Code:	23PCY2E1			Major Elective –I: Green Chemistry, Research methodology and Cyber Security		Batch:	2023 - 2025
						Semester:	II
Lecture Hrs./Week	3	Tutorial	-	Total Hrs/Sem	45	Credits:	3
Course Objective							
* To stimulate students to have in-depth knowledge in green chemistry.							
* To acquire a clear idea about various synthesis of Nanomaterials and techniques.							
* To gain knowledge about the significance of research and scientific writing.							
* To apply the principles of Cyber Security and its attack.							

Course Outcomes

On the completion of the course the student will be able to

#	CO Statement	Knowledge Level
CO1	Understand the principles and tools of green chemistry.	K2, K3
CO2	Recollect the hazardous effect of chemicals and solvents used in laboratory.	K3
CO3	Ability to write a good research report.	K5
CO4	Get the idea about cyber security.	K3
CO5	Apply the ideas of legal and ethical issues for cybercrime and plagiarism.	K4
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate		

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	M	H	H	H	M	H	M	M	H	M
CO2	M	H	M	H	M	H	M	M	H	H
CO3	H	M	H	M	H	H	H	H	H	M
CO4	H	M	H	H	M	H	M	H	M	M
CO5	H	H	M	M	M	H	M	M	H	M

H-High; M-Medium; L-Low

Programme Code:	M.Sc			Programme Title:	Master of Chemistry		
Course Code:	23PCY2E2			*Major Elective–I: Electrochemistry	Batch: 2023 - 2025		
					Semester: II		
Lecture Hrs./Week	3	Tutorial	-	Total Hrs/Sem	45	Credits:	3
Course Objective							
* Enable the students to understand the electrochemical principles.							
* To comprehend the various electrode reactions in electrode systems.							
* To learn about different batteries and fuel cells.							

Course Outcomes (CO)

On the successful completion of the course, students will be able to

#	Course Outcomes (CO)	Knowledge Level
CO1	Understand the behavior of electrolytes in terms of conductance, ionic atmosphere, interactions.	K1
CO2	Familiarize the structure of the electrical double layer of different models.	K2
CO3	Compare electrodes between current density and over potential.	K3
CO4	Discuss the mechanism of electrochemical reactions.	K4
CO5	Highlight the different types of over voltages and its applications in electroanalytical techniques.	K5
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 – Evaluate		

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	H	M	H	H	H	L	H	H	M	H
CO2	H	H	H	H	H	M	H	H	M	H
CO3	M	H	H	H	H	M	H	H	H	H
CO4	H	H	H	H	H	M	H	H	H	H
CO5	H	H	H	M	H	M	H	M	M	L

H-High; M-Medium; L-Low

Programme Code:	M.Sc			Programme Title:	Master of Chemistry		
Course Code:	23PCY2E3			Major Elective I – Advanced Polymeric Materials		Batch:	2023 – 2025
						Semester:	II
Lecture Hrs./Week	3	Tutorial	-	Total Hrs/Sem	45	Credits:	3
Course Objectives							
* To choose any research work related to the advanced polymeric materials.							
* To gain Knowledge about polymeric composites.							
* To learn the conducting and biomedical polymers and its applications.							

Course Outcomes

On the successful completion of the course, students will be able to

#	CO Statement	Knowledge Level
CO1	Acquire the knowledge about dendrimers, hyper-branched polymers and polymer nanocomposites.	K4
CO2	Recognize the importance of synthetic biomedical polymers for drug delivery and conducting polymers.	K5
CO3	Understand the synthetic route, structure, properties and uses of engineering plastics.	K2
CO4	Analyze the properties of new polymeric materials.	K4
CO5	Synthesize the new conducting and biomedical polymers	K5
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 –Evaluate		

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	H	H	M	H	H	M	H	M	H	H
CO2	H	M	H	H	H	H	M	H	H	H
CO3	M	H	H	H	H	H	H	H	H	H
CO4	H	M	H	H	-	H	H	-	M	L
CO5	H	H	H	H	H	M	H	H	L	H

H-High; M-Medium; L-Low

Programme Code:	M.Sc			Programme Title:		Master of Chemistry	
Course Code:	23PCY2N1			*Non Major Elective Chemistry in Day to Day Life		Batch:	2023 - 2025
						Semester:	II
Lecture Hrs./Week	2	Tutorial	-	Total Hrs/Sem	30	Credits:	2
Course Objective							
* To understand industrial preparations and materials of application in day today life.							
* To get an awareness about eco-friendly products to lead sustainable life.							
* To enable the student to understand about the manufacture of commercial products.							

Course Outcomes (CO)

On the successful completion of the course, students will be able to

#	Course Outcomes (CO)	Knowledge Level
CO1	Remember fundamental concepts of applied chemistry	K1
CO2	Understand the drugs used in day to day life.	K2
CO3	Test the various forms of drugs, cosmetics and milk products in day to day life.	K3
CO4	Predict the knowledge about the paints and cleansing agents.	K4
CO5	Analyze the composition of fertilizers, pesticides and milk products.	K5
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 – Evaluate		

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	H	H	H	H	-	-	H	H	-	H
CO2	H	H	M	M	M	-	-	-	M	H
CO3	H	H	H	M	H	M	H	M	M	H
CO4	H	M	H	-	H	M	H	M	-	H
CO5	H	M	H	-	H	M	H	M	-	H

H-High; M-Medium; L-Low

Programme Code:		M.Sc		Programme Title:			Master of Chemistry		
Course Code:		23PCY207		Inorganic Chemistry Practical –I			Batch:	2023 – 2025	
							Semester:	I & II	
Lecture Hrs/Week	I Sem	5	Tutorial	-	Total Hrs/Sem	I	75	Credits:	4
	II Sem	4				II	60		
Course Objectives									
* To equip the students with analytical skills by analyzing the given inorganic salt mixture containing two common cations and two rare cations.									
* To perform systematic qualitative analysis with the strong theoretical back ground.									
* To enable the students to prepare simple complexes by using published reactions.									

Course Outcomes

On the completion of the course the student will be able to

#	CO Statement	Knowledge Level
CO1	Separate common and rare cations.	K3
CO2	Analyze and report cations in a mixture.	K4
CO3	Analysis of synthesized compounds by UV Spectroscopy.	K4
CO4	Prepare and report coordination compounds.	K5
CO5	Develop skills in the synthesis of inorganic complexes.	K6

Mapping

PO / PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	H	H	M	H	H	H	H	H	H	M
CO2	H	H	M	H	H	M	H	H	H	M
CO3	H	H	M	H	H	H	H	H	H	H
CO4	H	H	M	H	H	M	H	H	H	M
CO5	H	H	M	H	H	-	H	H	H	M

H-High; M-Medium; L-Low

Programme Code:		M.Sc			Programme Title:			Master of Chemistry	
Course Code:		23PCY208			Organic Chemistry Practical –I			Batch:	2023 – 2025
								Semester:	I & II
Lecture Hrs./Week	I Sem	5	Tutorial	-	Total Hrs/Sem	I	75	Credits:	4
	II Sem	3				II	45		
Course Objective									
* To enable the students to separate two components in an organic mixture.									
* To identify the separated components by qualitative tests.									
* To prepare organic compounds and identify the organic compounds from the given spectral data.									
* Handle UV-Vis. spectrophotometer effectively.									
* Apply different chromatographic techniques for separating organic compounds.									

Course Outcomes

On the successful completion of the course, students will be able to

#	CO Statement	Knowledge Level
CO1	Remember the analysis of organic compounds and aromatic substitution reactions.	K1
CO2	Separate organic mixtures by solvent extraction and chromatographic techniques.	K4
CO3	Analyze organic compounds by IR, NMR and UV visible spectra.	K4
CO4	Develop skills in the synthesis of organic compounds.	K6
CO5	Determine boiling point /melting point.	K5
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 – Evaluate		

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	H	H	H	M	H	M	M	H	H	H
CO2	H	H	H	M	H	M	M	H	H	H
CO3	H	H	H	M	H	M	M	H	H	H
CO4	H	H	H	M	H	M	M	H	H	H
CO5	H	H	H	M	H	M	M	H	H	H

H –High; M-Medium; L-Low

Programme Code:		M.Sc			Programme Title:			Master of Chemistry	
Course Code:		23PCY209			Physical Chemistry Practical –I			Batch:	2023 – 2025
								Semester:	I & II
Lecture Hrs./Week	I Sem	5	Tutorial	-	Total Hrs/Sem	I	75	Credits:	4
	II Sem	3				II	45		
Course Objective									
* To make the students to understand the principle and to carry out the potentiometric titrations.									
* To determine the pH and P ^{K_a} values of buffers and acids.									
* To determine the molecular weight of solutes.									
* To construct the Phase diagram of two components systems.									

Course Outcomes (CO)

On the successful completion of the course, students will be able to

#	Course Outcomes (CO)	Knowledge Level
CO1	Recollect the concept of potentiometric titration.	K3
CO2	Understand the simple eutectic system, molecular weight determination by Rast method, partition coefficient and estimation of metal ions using colorimetry.	K4
CO3	Examine the strength of the solutions and K_a values by potentiometry.	K4
CO4	Calculate the molecular weight of chemical compounds from K_f values by Rast micro method.	K4
CO5	Estimate the metal ions using colorimetry.	K5
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 – Evaluate		

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	H	H	H	M	H	H	H	H	-	-
CO2	H	H	M	M	M	H	H	H	M	-
CO3	H	H	H	H	H	M	H	H	M	-
CO4	H	H	H	H	H	M	M	H	H	-
CO5	H	H	M	H	M	M	M	H	M	-

H –High; M-Medium; L-Low

HOD

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