

DEPARTMENT OF CHEMISTRY
SYLLABUS 2022- 2025
(OUTCOME BASED EDUCATION)

BOARD OF STUDIES 2022

I - VI SEMESTERS



NALLAMUTHU GOUNDER MAHALINGAM COLLEGE

(AUTONOMOUS)

Re-Accredited by NAAC

An ISO 9001: 2015 Certified Institution

POLLACHI – 642 001

NGM College

Vision

Our dream is to make the college an institution of excellence at the national level by imparting quality education of global standards to make students academically superior, socially committed, ethically strong, spiritually evolved and culturally rich citizens to contribute to the holistic development of the self and society.

Mission

Training students to become role models in academic arena by strengthening infrastructure, upgrading curriculum, developing faculty, augmenting extension services and imparting quality education through an enlightened management and committed faculty who ensure knowledge transfer, instill research aptitude and infuse ethical and cultural values to transform students into disciplined citizens in order to improve quality of life.

Department of Chemistry

Vision

The Department of Chemistry aspires to be among the top in the nation by preparing the students in such a way that they are self-reliant, highly informed and a better choice in the demanding and ever-changing world.

Mission

The teaching of Chemistry aims to: gear the students to be liberative, transformative and empowering the Learner and the Learned (Teacher).

Program Educational Objectives:

The graduates of B.Sc. Chemistry are expected to attain the following PEOs within five to seven years of their graduation. The main objectives of the programme are

PEO1	To prepare the students to have in depth knowledge and skills in the core areas of chemical science
PEO2	To develop the students to have multi-disciplinary subject knowledge both in the diverse fields of chemical science such as analytical chemistry, pharmaceutical chemistry, leather chemistry and also its allied subjects like mathematics, physics and biology
PEO3	To provide knowledge and skills in the frontier areas of chemical research
PEO4	To develop critical thinking, problem solving ability and analytical reasoning in solving the problems pertaining to the environment, sustainable development, their chosen career and higher studies
PEO5	To develop professional, practical, leadership and entrepreneurial skills in their chosen field and practice it with moral and ethical virtues

Program Outcomes:

PO1	<i>Ethics and social responsibilities</i> Commitment to sustainability and rich ethical standards in social and professional practices
PO2	<i>Communicative and writing skills</i> Understand the language usage with development of communicative and written skills
PO3	<i>Inter and trans disciplinary development</i> Understand principles and theories of organic, inorganic, physical, analytical, pharmaceutical, leather and environmental chemistry with cross cutting approach
PO4	<i>Problem solving analysis</i> Solve complex scientific problems by conducting scientific derivation or chemical analysis
PO5	<i>Individual and team work</i> Function effectively as member or leaders in diverse teams, and in multi-disciplinary environment
PO6	<i>Chemicals and tools usage</i> Acquire skills pertaining to safe handling of chemicals, apparatus, instruments and modern tools with proper functionality
PO7	<i>Disciplinary knowledge development</i> Apply possessed knowledge of fundamentals in chemistry to solve associated problems
PO8	<i>Professional skill development</i> To impart professional skill sets in chemistry and meet out the current chemical industries needs

Program Specific Outcomes:

PSO - 01	<i>Life long learning</i> Develop the practices of lifelong learning in laboratory, analytical/pharmaceutical/leather chemistry skills and interpret knowledge in the working environment
PSO - 02	<i>Education and Employment</i> Ability to pursue higher studies of specialization and take of employment in analytical/pharmaceutical/leather industry

Programme Code:	B.Sc			Programme Title:	Bachelor of Chemistry	
Course Code:	22UCY101			Title	Batch:	2022 – 2025
				Core Paper – I	Semester:	I
Lecture Hrs./Week	6	Tutorial Hrs./Sem.	1	Inorganic and Organic Chemistry	Credits:	5

Course Objective

To understand basic theoretical concepts on chemical bonding and hybridization, acquire knowledge on aromaticity, mechanistic pathway of aliphatic nucleophilic substitutions and aromatic electrophilic substitutions in organic reactions.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Recollect the types of chemical bonding	K1,K2
CO2	Deduce the geometry of the molecules and apply MOT to Homonuclear and Heteronuclear molecules and understand the basic theoretical concepts in inorganic qualitative analysis.	K2, K3
CO3	Write the nomenclature of organic compounds and analyze the reactions of alkenes and examine the relevant name reaction	K2, K4
CO4	Apply the concepts in determining the mechanisms of aliphatic nucleophilic substitution reactions	K3
CO5	Interpret the factors affecting in determining the orientation and reactivity of the aromatic compounds	K2, K5

Mapping with PO / PSO Vs CO

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

H – High; M – Medium; L – Low

Programme Code:	B.Sc			Programme Title:	Bachelor of Chemistry	
Course Code:	22UCY202			Title	Batch:	2022 – 2025
				Core Paper – II	Semester:	II
Lecture Hrs./Week	5	Tutorial Hrs./Sem.	1	Organic and Physical Chemistry	Credits:	4

Course Objective

To acquire knowledge on the mechanisms of reactions in carbonyl compounds, understand basic concepts on quantum chemistry and important laws of thermodynamics.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Discuss the preparation, properties of alcohols, dicarboxylic acids, hydroxy acids and esters	K2
CO2	Analyse the reactions of aldehydes / ketones and examine the relevant reactions and understand the basic principles involved in volumetric analysis	K4, K3
CO3	Apply quantum chemical treatment to sub-atomic particles of atom	K3
CO4	State and apply first law of thermodynamics, perform calculations for physical process	K3, K4
CO5	Analyse the feasibility of the reaction	K4

Mapping with PO / PSO Vs CO

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

H – High; M – Medium; L – Low

Programme Code:	B.Sc	Programme Title:	Bachelor of Chemistry	
Course Code:	22UCY203	Title	Batch:	2022 – 2025
		Core Practical-I	Semester:	II
Lecture Hrs./Week	3	Inorganic Qualitative Analysis	Credits:	3

Course Objective

To know about the skills of using glassware's and apparatus used in qualitative analysis, develop the analytical skills in inorganic qualitative analysis and know the chemistry principles applied in qualitative analysis.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Remember the procedure for the analysis	K1, K2
CO2	Understand and apply the theoretical knowledge to chemical reactions responsible for the reactions leading to identification of the given radicals	K2, K3
CO3	Separate the cations into groups and to identify them	K1, K4
CO4	apply the theoretical knowledge in the preparation of inorganic metal complexes	K3

Mapping with PO / PSO Vs CO

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

H – High; M – Medium; L – Low

Programme Code:	B.Sc.			Programme Title:	Bachelor of Chemistry	
Course Code:	22UCY304			Title	Batch:	2022 – 2025
				Core Paper- III Inorganic and Physical Chemistry	Semester:	III
Lecture Hrs./Week	6	Tutorial Hrs./Sem.	2		Credits:	4

Course Objective

To impart knowledge on basic metallurgical process, alloys, fuels and fertilizers and to expound conceptions on thermodynamics of solutions, phase equilibria and colligative properties to succeed at an entry-level position in chemical industry or a chemistry graduate program.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Recall the basic metallurgical operations and understand the preparation and properties of alloys.	K1 & K2
CO2	Understand the classification and properties of fuels and fertilizers	K2
CO3	Apply the concept of law of mass action to various equilibria	K3
CO4	Understand the concepts of thermodynamics of solution and construct and analyse the phase diagram.	K2 & K5
CO5	Correlate the relationship between colligative properties of dilute solutions and molecular mass of solute.	K5

Mapping with POs / PSOs Vs COs

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

H – High; M – Medium; L – Low

Programme Code:	B.Sc.	Programme Title:	Bachelor of Chemistry	
Course Code:	22UCY3N1	Title	Batch:	2022 – 2025
		Non Major Elective - I	Semester:	III
Lecture Hrs./Week	1	Introduction to Nanotechnology	Credits:	2

Course Objective

To create basic awareness about Nanoscience and Technology and its current applications.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Recollect the basics of nanoscience and nanomaterials	K1
CO2	Understand the various types of nanomaterials and the approaches towards the preparation of nanomaterials	K2
CO3	Sketch the specific properties of nanomaterials	K3
CO4	Illustrate the properties and uses of carbon nanomaterials	K3
CO5	Explain the applications of nanomaterials based on their properties	K3

Mapping with POs / PSOs Vs COs

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

H – High; M – Medium; L – Low

Course Code:	22UCY3N2	Title	Batch:	2022 – 2025
		Non Major Elective – I	Semester:	III
Lecture Hrs./Week	1	Chemistry of Consumer Products	Credits:	2

Course Objective

To acquire the basic knowledge in consumer product chemistry

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Label the ingredients present in consumer products	K1
CO2	Understand the action of soaps and detergents	K2
CO3	Demonstrate the formulation and uses of consumer products.	K3
CO4	Identify the required characteristics of cosmetics	K1
CO5	Describe the quality control and health hazards in cosmetics	K2

Mapping with POs / PSOs Vs COs

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

H – High; M – Medium; L – Low

Course Code:	22UCY3N2	Title	Batch:	2022 – 2025
		Non Major Elective – I	Semester:	III
Lecture Hrs./Week	1	Chemistry of Consumer Products	Credits:	2

Course Objective

To acquire the basic knowledge in consumer product chemistry

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Label the ingredients present in consumer products	K1
CO2	Understand the action of soaps and detergents	K2
CO3	Demonstrate the formulation and uses of consumer products.	K3
CO4	Identify the required characteristics of cosmetics	K1
CO5	Describe the quality control and health hazards in cosmetics	K2

Mapping with POs / PSOs Vs COs

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

H – High; M – Medium; L – Low

Programme Code:	B.Sc.			Programme Title:	Bachelor of Chemistry	
Course Code:	22UCY405			Title	Batch:	2022 – 2025
Lecture Hrs./Week	6	Tutorial Hrs./Sem.	1	Core Paper – IV General Chemistry - I	Semester:	IV
					Credits:	4

Course Objective

To explain the periodic properties of elements, various reactions and stereoisomerism of organic compounds phase rule, radioactivity and nuclear reactions

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Recollect the properties of transition and inner transition elements	K1
CO2	Understand the preparation, properties and various reactions of phenols, aliphatic and aromatic nitro compounds	K2
CO3	Analyse the classification of amines, separation, basic nature and optical and geometrical isomerism of certain organic compounds.	K4
CO4	Apply the concepts of phase rule, phase equilibria and its applications to various systems.	K3
CO5	Explain the radioactivity, types of nuclear reactions and the applications of isotopes.	K2, K5

Mapping with PO / PSO Vs CO

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

H – High; M – Medium; L – Low

Programme Code:	B.Sc.	Programme Title:	Bachelor of Chemistry	
Course Code:	22UCY406	Title	Batch:	2022 – 2025
		Core Practical –II	Semester:	IV
Practical Hrs/week	3	Volumetric, Organic Qualitative Analysis and Organic Preparations	Credits:	5

Course Objective

To develop the analytical skills in volumetric, organic qualitative analysis and organic preparations to succeed at a entry-level position as analyst in industry.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Remember the apparatus used in volumetric analysis	K1
CO2	Understand the titrimetric principle and procedure	K2
CO3	Get the idea about organic qualitative analysis	K3
CO4	Analyse the elements and functional groups of organic compounds.	K4
CO5	Prepare an organic compound following the prescribed procedure.	K5

Mapping with POs / PSOs Vs COs

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

H – High; M – Medium; L – Low

Programme Code:	B.Sc.	Programme Title:	Bachelor of Chemistry	
Course Code:	22UCY4N1	Title	Batch:	2022 – 2025
Lecture Hrs./Week		1	Semester:	IV
			Non Major Elective - II Textile Chemistry	Credits:

Course Objective

To develop basic awareness in the area of Textile chemistry.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Recollect the types of polymers, fibres and dyes	K1
CO2	Understand the morphology and properties of fibres	K2
CO3	Compare the natural and manmade fibres	K3
CO4	Classify dyes and dyeing processes	K3
CO5	Explain the nature of fibre and dye to attain a quality product	K3

Mapping with POs / PSOs Vs COs

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

H – High; M – Medium; L – Low

Programme Code:	B.Sc.	Programme Title:	Bachelor of Chemistry	
Course Code:	22UCY4N2	Title	Batch:	2022 – 2025
		Non Major Elective - II	Semester:	IV
Lecture Hrs./Week	1	Food Science and Technology	Credits:	2

Course Objective

To create an awareness on food and nutrition to non chemistry students.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Remember the sources, functions of food , food preservation and adulteration	K1
CO2	Understand the metabolic activities, methods of food preservation, and effects and identification of food adulteration	K2
CO3	Illustrate the various food additives and adulterants	K3
CO4	Explain the types of adulteration and tests for detection	K2
CO5	Interpret the functions of food corporation of India, ISI and Agmark standards.	K3

Mapping with POs / PSOs Vs COs

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

H – High; M – Medium; L – Low

Programme Code:	B.Sc.		Programme Title:	Bachelor of Chemistry	
Course Code:	22UCY507		Title	Batch:	2023 – 2025
			Core Paper- V	Semester:	V
Lecture Hrs./Week	4	Tutorials/ Sem	1	Coordination and Bioinorganic Chemistry	Credits: 4

Course Objective

To impart essential knowledge regarding the terminologies, theories of coordination chemistry, bonding, structure and stereochemistry of coordination compounds and Bioinorganic chemistry to succeed a chemistry graduate program.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Reminisce the important terms in coordination chemistry	K1
CO2	Understand different theories of coordination compounds	K2
CO3	Apply the theories of bonding in coordination complexes	K3
CO4	Predict the reaction mechanisms in coordination complexes and Determine the stability constant by Job's and Bjerum's method	K4 & K5
CO5	Acquire knowledge in Bioinorganic chemistry and metal carbonyls	K4

Mapping with POs / PSOs Vs COs

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

H – High; M – Medium; L – Low

Programme Code:	B.Sc.			Programme Title:	Bachelor of Chemistry	
Course Code:	22UCY508			Title	Batch:	2022 – 2025
				Core - VI	Semester:	V
Lecture Hrs./Week	4	Tutorial Hrs./Sem.	1	Organic Chemistry – I	Credits:	4

Course Objective

To make the students to understand the mechanisms of molecular rearrangements, to acquire knowledge on heterocyclic compounds, carbohydrate chemistry and structural elucidation of natural products.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Recollect and interpret the mechanisms of molecular rearrangements	K1, K4
CO2	Understand the significance of heterocyclic compounds	K2
CO3	Understand the importance of carbohydrate chemistry	K2
CO4	Apply and interpret various chemical methods in deducing the structures of alkaloids	K3,K4
CO5	Apply and deduce the structure of terpenoids	K3,K4

Mapping with POs / PSOs Vs COs

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

H – High; M – Medium; L – Low

Programme Code:	B.Sc.			Programme Title:	Bachelor of Chemistry	
Course Code:	22UCY509			Title	Batch:	2022 – 2025
				Core Paper – VII	Semester:	V
Lecture Hrs./Week	4	Tutorial Hrs./Sem.	1	Electro Chemistry	Credits:	4

Course Objective

To learn about the theories of conductance, basic principles and applications of electrochemical cells and apply electro chemical principles to fuel cells, batteries and mechanism of corrosion.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Discuss the theories/laws of conductance, apply the theories of electrolytes	K2, K3
CO2	Construct the electrochemical cell and apply the electrolytic cell reaction to calculate enthalpy, entropy and free energy	K4, K3
CO3	Analyze the types of solutions based on pH and predict suitable indicators for the volumetric titrations	K4, K2
CO4	Appraise the pH, valency, equilibrium constant for a given electrolyte	K4
CO5	Discuss the types of batteries, fuel cells, theories of corrosion & its mechanism	K5

Mapping with PO / PSO Vs CO

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

High – H, Medium – M, Low – L

Programme Code:	B.Sc.			Programme Title:	Bachelor of Chemistry	
Course Code:	22UCY510			Title	Batch:	2022 – 2025
				Core Paper – VIII	Semester:	V
Lecture Hrs./Week	4	Tutorial Hrs./Sem.	1	Dye Chemistry	Credits:	4

Course Objective

To enhance the basic knowledge and improve skills on preparation and uses of various dyes and fibres to choose their career as dye chemists in dyeing and textile industry.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Recall the classification, basic concepts, theories of colour and constitution	K1
CO2	Understand the preparation and applications of various azo and nitro dyes	K2, K4
CO3	Utilize the classification, preparation and uses of some important phenyl methane dyes	K3
CO4	Analyze the various anthraquinone dyes, organic pigments and fluorescent brightening agents	K4
CO5	Explain the preparation and properties of various types of textile fibres to dye industry and uses of non textile fibres	K2, K5

Mapping with PO / PSO Vs CO

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

H – High; M – Medium; L – Low

Programme code:	B.Sc.	Programme Title :	Bachelor of Chemistry	
Course Code:	22UCY5E1	Title	Batch :	2022 – 2025
		Core Elective Paper – I	Semester	V
Hrs/Week:	4	Analytical chemistry- I	Credits:	5

Course Objective

To build a basic knowledge on generation of analytical data in an appropriate manner. To expertise the instrumental methods of chemical analysis for microgram level; to cultivate the analytical skill in the structural identification of chemical compounds.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Provide thorough knowledge on gravimetry.	K1, K2
CO2	Learn instrumentation and basic principles and applications of modern analytical tools such as TGA and DTA	K2, K3
CO3	Have knowledge on application of Polarimetry, Nephelometry and Turbidimetry	K2, K4
CO4	Acquire knowledge and analyze analytical tools like polarography and amperometric titrations	K3
CO5	Know the importance of chromatography	K2, K5

Mapping with PO / PSOs Vs COs

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

H – High; M – Medium; L – Low

Programme Code:	B.Sc.	Programme Title:	Bachelor of chemistry	
Course Code:	22UCY5E2	Title	Batch:	2022 – 2025
Lecture Hrs./Week	4	Core Elective – I	Semester:	V
		Pharmaceutical Chemistry-I	Credits:	5

Course Objective

To create awareness among the students about the historical development of profession of Pharmacy, the formulation aspects of different dosage forms, and how a drug's chemical structure describe the factors that affect its absorption, distribution, metabolism, and excretion, traditional and alternative system of medicine and principles involved in limit test for impurities.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Identify their professional role in the healthcare system	K1
CO2	Classify different dosage forms and apply principles of pharmaceutical science in formulation and dispensing the various dosage forms	K2
CO3	Understand the concept of Pharmacology and pharmacodynamics	K3
CO4	Analyse the scope and development of Pharmacognosy	K4
CO5	Explain the types of impurities, limit test for impurities and classification of Antidotes and Antacids	K5

Mapping with POs / PSOs Vs COs

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

H – High; M – Medium; L – Low

Programme Code:	B.Sc.	Programme Title:	Bachelor of Chemistry	
Course Code:	22UCY5E3	Title	Batch:	2022 – 2025
		Core Elective – I	Semester:	V
Lecture Hrs./Week	4	Leather Chemistry	Credits:	5

Course Objective

To understand the basics of skins, leather and their composition, impart the principle involved in pre-tanning, structure, process of various tanning, process of dyeing leather and acquire knowledge on the water pollution by tannery industry and its effluent treatment.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Relate the basic principle involved in pre-tanning of skins and hides	K3
CO2	Have knowledge on various types of tanning and their physico-chemical properties	K2, K3
CO3	Interpret the chemistry behind the chrome tanning process	K4
CO4	Analyze the process involved in curing of hides and skin and their preservation	K1, K4
CO5	Have clear idea on sources of tannery effluents and their treatment	K2, K3

Mapping with POs / PSOs Vs COs

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

H – High; M – Medium; L – Low

Programme Code:	B.Sc.	Programme Title:	Bachelor of Chemistry	
Course Code:	22UCY5AL	Title	Batch:	2022 – 2025
		Advanced Learner Course – I	Semester:	V
Lecture Hrs./Week	Self Study	Environmental Chemistry (Optional)	Credits:	4*

Course Objective

To enhance the knowledge on environmental chemistry and to inculcate the responsibilities in protecting the environment from chemical and biological pollutants.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Remember the environmental constituents, air, water and soil contaminants and quality parameters.	K1,K2
CO2	Understand the environmental segments, composition and effects of pollution and types of biomedical wastes	K2, K3
CO3	Apply the suitable techniques for pollution control and waste management	K2, K3
CO4	Review the health, environmental and industrial problems caused by pollution	K4,K5
CO5	Distinguish various biomedical wastes judiciously and manage them properly	K4

Mapping with PO / PSO Vs CO

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

H – High; M – Medium; L – Low

Programme code:	B.Sc.	Programme Title :	Bachelor of Chemistry	
Course Code:	22UCY5S1	Title	Batch :	2022 – 2025
		Skill Based Elective-I Food Chemistry	Semester	V
Hrs/Week:	2		Credits:	2

Course Objective

To develop the skill to aesthetically appreciate Food Science

Course Outcome

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

CO Number	CO Statement	Knowledge Level
CO1	Remember the sources, functions of food , food preservation and adulteration	K1
CO2	Understand the metabolic activities, methods of food preservation, and effects and identification of food adulteration	K2
CO3	Illustrate the various food additives and adulterants	K3
CO4	Explain the types of adulteration and tests for detection	K2
CO5	Interpret the functions of food corporation of India, ISI and Agmark standards.	K3

Mapping with POs / PSOs Vs COs

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

H – High; M – Medium; L – Low

Programme code:	B.Sc.	Programme Title :	Bachelor of Chemistry	
Course Code:	22UCY5S2	Title	Batch :	2022 – 2025
		Cyber Security – Ethical Hacking	Semester	V
Hrs/Week:	2		Credits:	2

Course Objective

To understand the basics of cyber security and how ethical hacking is done on Cyber space and how to secure and protect them like security experts

Course Outcomes (CO)

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

CO Number	CO Statement	Knowledge Level
CO1	Remember the basic concepts of cyber security	K1,K2
CO2	Understand the knowledge about ethical hacking	K2, K3
CO3	Deploy the use of hacking tools	K2, K3
CO4	Understand the concepts of Network	K2
CO5	Advantages of internet	K3

Mapping with PO / PSOs Vs COs

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

H – High; M – Medium; L – Low

Programme Code:	B.Sc.			Programme Title:	Bachelor of Chemistry	
Course Code:	22UCY611			Title	Batch:	2022 - 2025
				Core – IX: Physical Methods and Chemical Structure	Semester:	VI
Lecture Hrs./Week	4	Tutorial Hrs./Sem.	1		Credits:	4

Course Objective

To make the students to acquire knowledge in basic concepts of spectroscopy, gain basic knowledge in various spectroscopic techniques like rotational, vibrational, Raman, UV-visible, NMR, EPR and Mass spectrometry and to understand the electrical and magnetic properties of molecules.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Recollect and understand the basic theoretical concepts in various types of spectroscopy	K1, K2
CO2	Interpret the structure of the unknown molecules from the given spectra	K4
CO3	Evaluate various parameters like bond length, vibrational frequency, Chemical shift, coupling constant from different spectroscopic techniques	K4
CO4	Understand the crystal packing and defects in ionic and covalent solids	K2
CO5	Apply electrical and magnetic properties in solving the structures of the molecules	K3, K4

Mapping with PO / PSOs Vs COs

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

H – High; M – Medium; L – Low

Programme Code:	B.Sc.			Programme Title:	Bachelor of Chemistry	
Course Code:	22UCY612			Title	Batch:	2022 - 2025
				Core – X	Semester:	VI
Lecture Hrs./Week	4	Tutorial Hrs./Sem.	1	Organic Chemistry - II	Credits:	4

Course Objective

To enhance the basic knowledge of the chemistry of solving problems, polynuclear hydrocarbons, amino acids, peptides, proteins, lipids, vitamins and chemotherapy.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Remember in solving problems of some functional groups and preparation, properties, reactions of polynuclear hydrocarbons	K1
CO2	Relate the structure and properties of amino acids, nucleic acids and peptides	K2
CO3	Analyze the classification, constitution and synthesis of proteins, lipids and vitamins	K4
CO4	Explain the synthesis of amino acids and peptides and functions, energy carriers of nucleotides.	K5
CO5	Develop the skill to classify the drugs such as chemotherapy, sulphadru gs , antimalarials, aneas thetics and antibiotics	K3

Mapping with PO / PSO Vs CO

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

H – High; M – Medium; L – Low

Programme Code:	B.Sc.			Programme Title:	Bachelor of Chemistry	
Course Code:	22UCY613			Title	Batch:	2022 – 2025
				Core - XI	Semester:	VI
Lecture Hrs./Week	4	Tutorials /Sem	1	Chemical Kinetics and Quantum mechanics	Credits:	4

Course Objective

To acquire the necessary knowledge on type of reactions, determination of rate, theories of reaction rate, mechanism of catalytic action, basics and kinetics of photochemical reactions and the fundamentals of quantum mechanics.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Recognize the basic terminologies of chemical kinetics	K1
CO2	Understand the theories of reaction rates	K2
CO3	Analyse the types and kinetics of catalysis, adsorption isotherms and their significance.	K3
CO4	Describe the laws of photochemistry and theories of reaction rates and explain various photochemical processes using Jablonski diagram	K4 & K5
CO5	To become familiar with the quantum mechanical functions and operators	K2

Mapping with POs / PSOs Vs COs

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

H – High; M – Medium; L – Low

Programme Code:	B.Sc.			Programme Title:	Bachelor of Chemistry	
Course Code:	22UCY614			Title	Batch:	2022 – 2025
				Core – XII	Semester:	VI
Lecture Hrs./Week	4	Tutorial Hrs./Sem.	1	Polymer Chemistry	Credits:	4

Course Objective

To learn about recent advances in polymers, impart knowledge about polymerization reactions and stereo chemistry, familiarize the different polymer processing techniques and synthesis of some commercially important polymers.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Classify the types of polymers and recognize the basic concepts	K2
CO2	Understand and illustrate the mechanisms of polymerization	K2,K3
CO3	Appraise the stereochemistry of polymers and apply Z-N catalyst for the polymers	K4, K3
CO4	Calculate the molecular weight of polymers by various methods	K3
CO5	Acquiring knowledge of commercially important polymer products and its applications.	K2, K5

Mapping with PO / PSO Vs CO

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

H – High; M – Medium; L – Low

Programme code:	B.Sc.	ProgrammeTitle :	Bachelor of Chemistry	
Course Code:	22UCY6E1	Title	Batch :	2022-2025
		Core Elective - II :	Semester	VI
Hrs/Week:	4	Analytical Chemistry - II	Credits:	5

Course Objective

To acquire knowledge on basic concepts in separation techniques, volumetric analysis, various types of titrations, and Core Elective - II : Analytical Chemistry understand the basic principles of instrumentation.

Course Outcome

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic principles of UV-visible spectrophotometer and IR spectrophotometer.	K1, K2
CO2	Apply separation techniques for the extraction of solvents	K2, K3
CO3	Understand the basic principles involved in neutralization titrations, PH and Buffer solutions.	K2, K4
CO4	Know about different types of titrations	K3
CO5	Gain knowledge on Analytical method in chemistry	K2, K5

Mapping with PO / PSOs Vs Cos

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

H – High; M – Medium; L – Low

Programme Code:	B.Sc.			Programme Title:	Bachelor of Chemistry	
Course Code:	22UCY6E2			Title	Batch:	2022 – 2025
				Core Elective- II	Semester:	VI
Lecture Hrs./Week	4	Tutorial Hrs./Sem.	1	Pharmaceutical Chemistry-II	Credits:	5

Course Objective

To inculcate the basic knowledge on the preparation, properties and uses of some organic, inorganic and radioactive drugs to make the students opt their career in pharmaceutical industry.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Remember the names of organic, inorganic and radioactive drugs and their basic analysis.	K1
CO2	Understand the preparation of organic and inorganic drugs and the principles behind their analysis.	K2
CO3	Apply the properties of pharmaceuticals towards their respective applications.	K3
CO4	Sketch the radioactivity, precautions and the storage conditions of radioactive drugs.	K3
CO5	Analyze and apply the available analytical techniques towards the quantification of organic and inorganic pharmaceuticals.	K3&K4

Mapping with POs / PSOs Vs COs

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

H – High; M – Medium; L – Low

Programme Code:	B.Sc.	Programme Title:	Bachelor of Chemistry	
Course Code:	22UCY6E3	Title	Batch:	2022 – 2025
		Core Elective- II- Agricultural Chemistry and Analytical Techniques for Agrochemicals	Semester:	VI
Lecture Hrs./Week	4		Credits:	5

Course Objective

To give the students the importance of Agricultural chemistry and an exposure to find, analyse and find a suitable method to cultivate and promote agricultural methods.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To understand the nature of soil.	K1,K2
CO2	Gain Knowledge on Soil fertility and Organic Manures	K2, K3
CO3	Find applications of Pesticides, Rodenticides and Herbicides and weedicides	K3
CO4	Know the analysis of agrochemicals by Potentiometry and Electrical conductivity	K4
CO5	Know the application of Non Instrumental Techniques in the analysis of agrochemicals	K4

Mapping with PO / PSO Vs CO

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

High- H, Medium-M, Low-L

Programme Code:	B.Sc.	Programme Title:	Bachelor of Chemistry	
Course Code:	22UCY615	Title	Batch:	2022 – 2025
Practical Hrs./Week	6	Core Practical - III	Semester:	VI
		Gravimetric Analysis and Physical Chemistry Experiments	Credits:	5

Course Objective

To develop practical and analytical skills in gravimetry and physical chemistry.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic concept of gravimetric analysis	K1
CO2	Analyse cations and anions quantitatively using gravimetric method	K1-K4
CO3	Enable the students to acquire practical skills in physical chemistry experiments	K3
CO4	Perform conductometric and potentiometric titrations and arrive the endpoint	K3,K4
CO5	Perform graphical analysis based on experimental data and to validate the experimental results	K5

Mapping with POs / PSOs Vs COs

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

High- H, Medium-M, Low-L

Programme Code:	B.Sc.	Programme Title:	Bachelor of Chemistry	
Course Code:	22UCY6AL	Title	Batch:	2022 - 2025
		Advanced Learner Course –	Semester:	VI
Lecture Hrs./Week	Self study	II: Applications of Spectroscopy (Optional)	Credits:	4*

Course Objective

To acquire knowledge and skills in the interpretation of various spectra of the molecules and applications of spectroscopy.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Calculate the absorption maxima and interpret the types of electronic transitions of compounds in absorption spectra	K3, K4
CO2	Analyse the IR spectra and predict the type of functional group	K4
CO3	Identify the structure of molecule with the NMR Spectra	K4
CO4	Determine and deduce the molecular mass and structure of the molecules using fragmentation pattern of mass spectra	K3, K4
CO5	Apply the knowledge of hyperfine splitting in the prediction of EPR spectra	K3

Mapping with POs / PSOs Vs COs

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

H – High; M – Medium; L – Low

Programme code:	B.Sc.	Programme Title :	Bachelor of Chemistry	
Course Code:	22UCY6S1	Title	Batch :	2022 – 2025
		Skill Based Elective –II	Semester	VI
Hrs/Week:	2	Green Chemistry	Credits:	2

Course Objective

To learn about the environmental status, public awareness in evolution, principles involved in green chemistry, bio-catalytic reactions, global warming and its control measures, availability of green analytical methods.

Course Outcome

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

CO Number	CO Statement	Knowledge Level
CO1	Define the green chemistry	K1
CO2	Understand the basic principles of green chemistry	K2
CO3	Identify the environment friendly technologies and working conditions	K3
CO4	Analyse eco-friendly and less wasteful manufacturing process for the sustainable development of our country	K2 & K3
CO5	Know about the various analytical green methods	K3

Mapping with PO / PSO Vs CO

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

High- H, Medium-M, Low-L

Programme code:	B.Sc.	Programme Title :	Bachelor of Chemistry	
Course Code:	22UCY6S2	Title	Batch :	2022 – 2025
		Skill Based Elective-II	Semester	VI
Hrs/Week:	2	Clean energy	Credits:	2

Course Objective

To develop the theoretical knowledge in practical chemistry.

Course Outcome

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

CO Number	CO Statement	Knowledge Level
CO1	Know about renewable and non-renewable energy resources	K1,K2
CO2	Understand solar energy and working of solar cells	K2, K3
CO3	Develop knowledge on working of wind mill	K1, K2
CO4	Find the application of bio energy	K3
CO5	Study environmental aspect of Tidal, ocean and geothermal energy	K3

Mapping with PO / PSO Vs CO

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

H – High; M – Medium; L – Low

Programme code:	B.Sc.	Programme Title :	Bachelor of Chemistry	
Course Code:	22UPS3A4/	Title	Batch :	2022-2025
	22UBY3A4/ 22UZY3A4	Allied Chemistry Paper – I Inorganic, Organic and Physical Chemistry	Semester	III
Hrs/Week:	6		Credits:	4

Course Objective

To learn the chemistry of chemical bonding and co-ordination compounds. To understand basic principles of volumetric analysis and water treatment. To learn the chemistry of basic aromatic compounds. To know about some common diseases and the drugs used. To study about electrochemical conductance.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the principle of chemical bonding, coordination chemistry and applications of biologically important molecules.	K1,K2
CO2	Gain Knowledge on volumetric analysis and water treatment process	K2, K3
CO3	Sketch the synthesis of heterocyclic compounds and reactions of aromatic compounds and heterocycles.	K3
CO4	Explain pharmaceutical chemistry with some important drugs	K4
CO5	Know the basic principle of electro chemistry and corrosion	K4

Mapping with PO / PSO Vs CO

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

High- H, Medium-M, Low-L

Programme Code:	B.Sc.	Programme Title :	Bachelor of Chemistry	
Course Code:	22UPS4A5/ 22UBY4A5/ 22UZY4A5	Title	Batch :	2022-2025
		Allied Chemistry Paper – II Inorganic, Organic and Physical Chemistry	Semester	IV
Hrs/Week:	6		Credits:	4

Course Objective

To study about fuels, fertilizers, cement and glass. To learn about the importance of dyes and polymer science. To know about carbohydrates, amino acids, proteins and nucleic acid. To understand the different kinds of colloids and catalysis.

Course Outcome

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

CO Number	CO Statement	Knowledge Level
CO1	Understand and apply the basics of fuel, fertilizers, glass and cement	K2, K3
CO2	Recognize the basic ideas on synthetic dyes and synthetic polymers.	K1
CO3	Demonstrate the chemistry of amino acids and proteins.	K3
CO4	Illustrate the carbohydrates, their types and properties	K3
CO5	Explain colloids, catalysis and phase rule	K4

Mapping with PO / PSO Vs CO

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

High- H, Medium-M, Low-L

Programme code:	B.Sc.	Programme Title :	Bachelor of Chemistry	
Course Code:	22UPS 4A6/ 22UBY4A6/	Title	Batch :	2022-2025
		Allied Chemistry Practical	Semester	III & IV
Hrs/Week:	2		Credits:	2

Course Objective

To understand the principles of volumetric analysis. To enable the students to have hands-on training on qualitative analysis of organic compounds.

Course Outcome

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

CO Number	CO Statement	Knowledge Level
CO1	Learn how to conduct a volumetric estimation process precisely.	K1,K2
CO2	Understand reactions taking place during the experiment.	K2, K5
CO3	Get the idea about organic qualitative analysis	K2, K4
CO4	Distinguish between aliphatic and aromatic, saturated and unsaturated compounds.	K3
CO5	Evaluate the reactivity of various functional groups	K2, K5

Mapping with PO / PSO Vs CO

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

High- H, Medium-M, Low-L

Programme Code:	B.Sc.	Programme Title:	Bachelor of Chemistry	
Course Code:	22UCY5VA	Title	Batch:	2022 – 2025
		Value Added Course -	Semester:	V
Lecture Hrs./Week	30 Hrs	Biofertilizers	Credits:	2*

Course Objective

To acquire the basic knowledge on biofertilizer, microbes, cyanobacteria, mycorrhizal, organic farming, recycling and vermicompost.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Remember the microbial diversity in various agro-ecologies for biofertilizer application in diversified systems.	K1
CO2	Develop the integrated management for better crop production by using microbes	K2
CO3	Identify the different forms of biofertilizers and their uses	K3
CO4	Compare the effect of mycorrhizal symbiosis on the growth and productivity of plants	K1, K2
CO5	Understand the process of green manuring and organic fertilizers	K2

Mapping with PO / PSO Vs CO

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

H – High; M – Medium; L – Low

Programme code:	B.Sc.	Programme Title :	Bachelor of Chemistry	
Course Code:	22UCY6VA1	Title	Batch :	2022 – 2025
		Value Added Course -	Semester	VI
Hrs/Week:	30 Hrs	Chemistry in Every Day Life	Credits:	2*

Course objective:

To provide general information of the chemistry behind these will create awareness as to what is good and what is bad and to be discarded.

Course Outcome

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

CO Number	CO Statement	Knowledge Level
CO1	Know about the soaps.	K1
CO2	Understand about Synthetic Detergents preparation and their applications.	K2
CO3	Find the applications of cosmetics	K2 & K3
CO4	Find the merits and demerits of Plastics and Dyes	K1 & K2
CO5	Understand the application of fertilizers and pesticides	K2

Mapping with PO / PSO Vs CO

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

High- H, Medium-M, Low-L

Programme code:	B.Sc.	Programme Title :	Bachelor of Chemistry	
Course Code:	22UCY6VA2	Title	Batch :	2022 – 2025
		Value Added Course – Textile	Semester	VI
Hrs/Week:	30 Hrs	Chemistry	Credits:	2*

Course objective:

To provide knowledge about the basics of fibers, impurities present and their purification.

Course Outcome

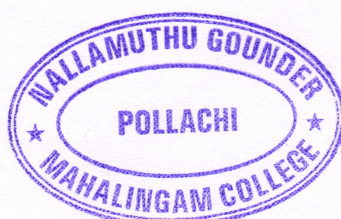
On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the structure of natural fibers	K1-K3
CO2	Understand the production, properties and uses of natural fibers	K2-K5
CO3	Know Properties and Uses of Synthetic Fibers	K2 & K3
CO4	Understand the structure of synthetic fibers	K1 & K2
CO5	Identify the impurities present in cotton and silk and know the processes to remove them	K2

Mapping with PO / PSO Vs CO

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

High- H, Medium-M, Low-L



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