DEPARTMENT OF CHEMISTRY

<M.Sc. Chemistry>

VISION

- To advance knowledge through innovative research and education
- To empower students to excel across scientific fields
- To contribute to global well-being through sustainable chemistry

MISSION

- To empower students with a strong conceptual foundation across all branches of chemistry, foster genuine interest through engaging coursework and hands-on learning, and nurture holistic growth by cultivating scientific curiosity, analytical thinking, ethical responsibility, leadership, and lifelong learning.
- To advance research and innovation by providing access to cutting-edge laboratories, promoting interdisciplinary exploration—especially in organic, bioorganic, inorganic, and physical chemistry—and strengthening industry collaborations for real-world impact.
- To contribute to global well-being by integrating emerging fields such as green chemistry, nanotechnology, polymer science, and environmental chemistry into education and research, and by developing sustainable chemical solutions that address societal and environmental challenges.

PROGRAMME EDUCATIONAL OBJECTIVES:

PEO1: To enable the graduates develop state-the-art skills on a wide variety of topics related to Chemical Sciences and also recognize how advancements in one scientific discipline catalyze progress in others, and how integrating knowledge from diverse fields—including humanities, social sciences, and the arts—can inspire novel scientific theories and sustainable solutions to real-world challenges.

PEO2: To endow the graduates the ability to think critically, conduct objective scientific investigations, construct coherent arguments, and evaluate theories and policies using a scientific approach. They will also appreciate the foundational role of Chemistry as a discipline in shaping scientific progress throughout human civilization.

PROGRAM SPECIFIC OUTCOME (PSOs)

PSO1: - To demonstrate strong theoretical and experimental understanding across core and specialized areas of chemistry, including Analytical, Inorganic, Organic, Physical, and Material Chemistry, along with awareness of current advancements in the field.

PSO2: To apply interdisciplinary knowledge to real-world problems, perform qualitative and quantitative chemical analyses using modern techniques, handle hazardous substances safely, and design socially relevant research projects both independently and collaboratively.

PSO3: To present scientific findings clearly and professionally through oral, written, and digital formats, suitable for academic, industrial, and public platforms.

PROGRAMME OUTCOMES:

PO1: Disciplinary knowledge and creative thinking: Students will acquire an advance level theoretical and practical knowledge in the major fields of inorganic, organic, physical, analytical, material and computational chemistry. They will be able to think creatively (divergently and convergent) to propose novel ideas in explaining facts and figures or providing new solution to the problems in chemistry.

PO 2: Personality Development and Enlightened Citizenship: Students will imbibe ethical, moral and social values in personal and social life leading to highly cultured and civilized personality. They will gain multicultural awareness such as race, gender, physical ability, age, income and other social variables to become an enlightened citizen with commitment to deliver one's responsibilities within the scope of bestowed rights and privileges.

PO 3: Scientific communication skills: The program will imbibe effective scientific and / or technical communication, which will help in expressing ideas and views clearly and effectively.

PO 4: Leadership qualities: Capability for mapping out the tasks of a team or an organization, and setting direction, formulating an inspiring vision, building a team who can help achieve the vision, motivating and inspiring team members to engage with that vision, and using management skills to guide people to the right destination in a smooth and efficient way

PO 5: Environmental monitoring: Students will be aware of the recent developments in the field of green and eco-friendly reactions, research and development. They will be able to understand the **e**nvironmental issues and will create awareness in society.

PO 6: Ethical awareness: Students will continue to acquire relevant knowledge and skills appropriate to professional activities and demonstrate highest standards of ethical issues in the subject concerned. They will develop ability to identify unethical behavior such as fabrication, falsification or misrepresentation of data and adoptive objective, unbiased and truthful actions in all aspects.

PO 7: Lifelong learning: They will also realize that pursuit of knowledge is a lifelong activity and in combination with untiring efforts and positive attitude and other necessary qualities leads towards a successful life. They will acquire knowledge and skills through logical reasoning and to inculcate the habit of self-learning throughout life, through self-paced and self- directed learning aimed at personal development, and adapting to changing academic demands of work place through knowledge/ skill development/ reskilling.

PO 8: Skills in research and industrial field and job opportunity: Students will build a scientific temper and will be able to learn the necessary skills to succeed in research or industrial field. In addition they will acquire the skills in handling scientific instruments, planning and performing in laboratory experiments. They can also act as a team player by contributing in laboratory, field based situation and industry.

Credit Definition

Type	Duration (in hours)	Credit
Lecture (L)	1	1
Tutorial (T)	1	1
Practical (P)	2	1

Total Credit Distribution for the Entire Programme

Semester	Credits										Credits/Semester
	CC	DSE	Project	NM	NV	GE	USC	SEC	VAC	INT	
1	20	0	0	0	0	0	2	1	0	0	23
2	20	4	0	0	0	4	2	1	0	0	31
3	20	4	0	0	0	0	2	1	0	0	27
4	0	0	20	0	0	0	2	1	0	0	23
Credits/Course	**60**	**8**	**20**	**0**	**0**	**4**	**8**	**4**	**0**	**0**	**104**

Category Definition

Definition of Category/Type	Abbreviation
Core Course	**CC**
Discipline Specific Elective	**DSE**
General Elective	**GE**
University Specified Course	**USC**
Skill Enhancement Course	**SEC**

FIRST YEAR

SEMESTER-I

Sl No	Course Title	Code	Type	Credit	Type		
					L	T	P
1	Inorganic Chemistry I		CC	4	4	0	0
2	Organic Chemistry I		CC	4	4	0	0
3	Organic Chemistry II		CC	4	4	0	0
4	Physical Chemistry I		CC	4	4	0	0
5	Organic Chemistry LAB I & Inorganic Chemistry LAB I		CC	4	0	0	8
6	Foreign language – I		USC	2	2	0	0
7	Mentored Seminar – I		SEC	1	0	0	0
Total Credits				23 Credits			

SEMESTER-II

Sl No	Course Title	Code	Type	Credit	Type		
					L	T	P
1	Inorganic Chemistry II		CC	4	4	0	0
2	Inorganic Chemistry III		CC	4	4	0	0
3	Organic Chemistry III		CC	4	4	0	0
4	Physical Chemistry II		CC	4	4	0	0
5	Physical Chemistry LAB I & Organic Chemistry LAB II		CC	4	0	0	8
6	Biophysical Chemistry and Instrumentation		DSE	4	4	0	0
7	Generic Elective (Selected by the Candidate)		GE	4	4	0	0
8	Foreign language – II		USC	2	2	0	0
9	Mentored Seminar – II		SEC	1	1	0	0
Total Credits				31 Credits			

SECOND YEAR

SEMESTER-III

Sl No	Course Title	Code	Type	Credit	Type		
					L	T	P
1	Inorganic Chemistry IV		CC	4	4	0	0
2	Organic Chemistry IV		CC	4	4	0	0
3	Physical Chemistry III		CC	4	4	0	0
4	Physical Chemistry IV		CC	4	4	0	0
5	Inorganic Chemistry LAB II & Physical Chemistry LAB II		CC	4	0	0	8
6	Pharmaceutical Science and Drug Delivery		DSE	4	4	0	0
7	Foreign language – III		USC	2	2	0	0
8	Mentored Seminar – III		SEC	1	1	0	0
Total Credits				27 Credits			

SEMESTER-IV

Sl No	Course Title	Code	Type	Credit	Type		
					L	T	P
1	Chemistry Master Project / Dissertation		Project	20	0	0	40
2	Foreign language – IV		USC	2	2	0	0
3	Chemistry Master Seminar		SEC	1	1	0	0
Total Credits				23 Credits			

COURSE CO-PO-PSO MAPPING

SEMESTER-I

CC1: Inorganic Chemistry I

COURSE OUTCOMES:

After completion of the course, the students will be able to:

CO1: Explain bonding theories in coordination and bioinorganic complexes.

CO2: Design new molecular cluster models for catalytic applications.

CO3: Judge stability of metal complexes.

CO4: Differentiate structural features of clusters and coordination compounds.

CO5: Utilize coordination chemistry principles in biological system studies.

MAPPING OF COs WITH POs AND PSOs

COURSE OUTCOMES	PROGRAMME OUTCOMES								PROGRAMME SPECIFIC OUTCOMES		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	2	2	2	2	1	2	1	1	2	1
CO2	3	3	3	2	3	1	2	1	2	2	2
CO3	3	3	3	3	3	1	2	3	3	2	2
CO4	3	3	2	2	3	1	2	2	2	3	1
CO5	3	3	3	3	3	2	2	3	3	3	3

1. LOW 2. MODERATE 3. SUBSTANTIAL

CC-2: Organic Chemistry I

COURSE OUTCOMES:

After completion of the course, the students will be able to:

CO1: Recall stereochemical principles of organic molecular structures.

CO2: Design new organometallic complexes for catalytic reactions.

CO3: Judge stability of reactive intermediates using mechanisms.

CO4: Differentiate stereoisomers based on optical activity.

CO5: Implement organometallic compounds in synthetic transformations.

MAPPING OF COs WITH POs AND PSOs

COURSE OUTCOMES	PROGRAMME OUTCOMES								PROGRAMME SPECIFIC OUTCOMES		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	1	2	1	1	1	2	1	3	2	1
CO2	3	2	2	2	3	1	2	2	3	3	2
CO3	3	2	2	2	2	1	2	2	3	2	2
CO4	3	1	2	1	2	1	2	1	3	2	1
CO5	3	2	2	2	3	2	2	3	3	3	2

1. LOW 2. MODERATE 3. SUBSTANTIAL

CC-3: Organic Chemistry-II

COURSE OUTCOMES:

After completion of the course, the students will be able to:

CO1: Identify characteristic signals of molecules using spectroscopy.

CO2: Formulate synthetic pathways integrating multiple spectroscopic techniques.

CO3: Critique accuracy of spectral data in organic synthesis.

CO4: Examine structural features through comparative spectral analysis.

CO5: Utilize spectroscopic evidence to solve synthetic problems.

MAPPING OF COs WITH POs AND PSOs

COURSE OUTCOMES	PROGRAMME OUTCOMES								PROGRAMME SPECIFIC OUTCOMES		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	1	2	1	1	1	2	1	3	2	2
CO2	3	2	2	2	2	1	2	2	3	3	3
CO3	3	2	2	2	2	1	2	2	3	2	3
CO4	3	1	2	1	2	1	2	1	3	2	2
CO5	3	2	2	2	2	2	2	3	3	3	3

1. LOW 2. MODERATE 3. SUBSTANTIAL

CC-4: Physical Chemistry I

COURSE OUTCOMES:

After completion of the course, the students will be able to:

CO1: Outline partition functions and their role in thermodynamics.

CO2: Construct quantum mechanical models for simple atomic systems.

CO3: Appraise group theoretical methods in molecular orbital analysis.

CO4: Break down thermodynamic variables influencing equilibrium conditions.

CO5: Employ quantum principles to interpret atomic and molecular spectra.

MAPPING OF COs WITH POs AND PSOs

COURSE OUTCOMES	PROGRAMME OUTCOMES								PROGRAMME SPECIFIC OUTCOMES		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	1	2	1	2	1	2	1	3	2	1
CO2	3	2	2	2	2	1	2	2	3	3	2
CO3	3	2	2	2	2	1	2	2	3	2	3
CO4	3	1	2	1	3	1	2	1	3	2	1
CO5	3	2	2	2	2	1	2	2	3	3	3

1. LOW 2. MODERATE 3. SUBSTANTIAL

CC-5: Organic Chemistry I and Inorganic Chemistry I LAB

COURSE OUTCOMES:

After completion of the course, the students will be able to:

CO1: Perform synthesis and characterization of organic, inorganic, organometallic compounds.

CO2: Assess purity and redox properties using analytical techniques.

CO3: Analyse reaction mechanisms and effects of functional groups.

CO4: Determine analyte concentrations using titrimetric and spectroscopic methods.

CO5: Demonstrate principles of synthesis, purification, and functional group roles.

COURSE OUTCOMES	PROGRAMME OUTCOMES								PROGRAMME SPECIFIC OUTCOMES		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	2	2	2	2	2	2	3	3	3	2
CO2	3	2	2	1	2	2	2	2	3	3	2
CO3	3	2	2	2	2	1	2	2	3	2	2
CO4	3	1	2	1	2	2	2	3	3	3	3
CO5	3	2	2	2	2	2	2	3	3	3	2

MAPPING OF COs WITH POs AND PSOs

1. LOW 2. MODERATE 3. SUBSTANTIAL

SEMESTER-II

CC-6: Inorganic Chemistry II

COURSE OUTCOMES:

After completion of the course, the students will be able to:

CO1: Describe symmetry elements and molecular orbitals in complexes.

CO2: Construct supramolecular models involving d- and f-elements.

CO3: Assess electronic transitions in lanthanide and actinide compounds.

CO4: Compare structural variations across d-block and f-block series.

CO5: Implement group theoretical methods in vibrational spectroscopy.

MAPPING OF COs WITH POs AND PSOs

COURSE OUTCOMES	PROGRAMME OUTCOMES								PROGRAMME SPECIFIC OUTCOMES		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	1	2	1	2	1	2	1	3	2	2
CO2	3	2	2	2	2	1	2	2	3	3	2
CO3	3	2	2	2	3	1	2	2	3	2	3
CO4	3	1	2	1	3	1	2	1	3	2	2
CO5	3	2	2	2	2	1	2	2	3	3	3

1. LOW 2. MODERATE 3. SUBSTANTIAL

CC-7: Inorganic Chemistry III

COURSE OUTCOMES:

After completion of the course, the students will be able to:

CO1: Summarize principles of ESR and Mössbauer spectroscopic techniques.

CO2: Develop experimental approaches for studying magnetic properties.

CO3: Critique spectral data to determine oxidation states accurately.

CO4: Distinguish hyperfine interactions in ESR and Mössbauer spectra.

CO5: Apply magnetic measurements to characterize transition metal complexes.

MAPPING OF COs WITH POs AND PSOs

COURSE OUTCOMES	PROGRAMME OUTCOMES								PROGRAMME SPECIFIC OUTCOMES		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	1	2	1	2	1	2	1	3	2	2
CO2	3	2	2	2	2	1	2	2	3	3	2
CO3	3	2	2	2	2	1	2	2	3	2	3
CO4	3	1	2	1	2	1	2	1	3	2	2
CO5	3	2	2	2	2	2	2	3	3	3	3

1. LOW 2. MODERATE 3. SUBSTANTIAL

CC-8: Organic Chemistry III

COURSE OUTCOMES:

After completion of the course, the students will be able to:

CO1: Explain principles of photochemical and pericyclic reaction mechanisms.

CO2: Design novel synthetic strategies using olefin metathesis.

CO3: Assess feasibility of named reactions in complex synthesis.

CO4: Differentiate pericyclic reactions based on orbital interactions.

CO5: Utilize photochemical processes for advanced organic transformations.

MAPPING OF COs WITH POs AND PSOs

COURSE OUTCOMES	PROGRAMME OUTCOMES								PROGRAMME SPECIFIC OUTCOMES		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	1	2	1	2	1	2	1	3	2	2
CO2	3	2	2	2	2	1	2	2	3	3	2
CO3	3	2	2	2	2	1	2	2	3	2	3
CO4	3	1	2	1	2	1	2	1	3	2	2
CO5	3	2	2	2	2	2	2	3	3	3	3

1. LOW 2. MODERATE 3. SUBSTANTIAL

CC-9: Physical Chemistry II

COURSE OUTCOMES:

After completion of the course, the students will be able to:

CO1: Illustrate fundamental principles of rotational and vibrational spectra.

CO2: Design spectroscopic experiments using laser-based techniques.

CO3: Judge accuracy of Raman and electronic spectral interpretations.

CO4: Differentiate spectral transitions across UV, IR, and Raman.

CO5: Apply laser concepts in modern spectroscopic instrumentation.

MAPPING OF COs WITH POs AND PSOs

COURSE OUTCOMES	PROGRAMME OUTCOMES								PROGRAMME SPECIFIC OUTCOMES		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	1	2	1	2	1	2	1	3	2	2
CO2	3	2	2	2	2	1	2	2	3	3	2
CO3	3	2	2	2	2	1	2	2	3	2	3
CO4	3	1	2	1	2	1	2	1	3	2	2
CO5	3	2	2	2	2	2	2	3	3	3	3

1. LOW 2. MODERATE 3. SUBSTANTIAL

CC-10: Organic Chemistry II and Physical Chemistry I LAB

COURSE OUTCOMES:

After completion of the course, the students will be able to:

CO1: Perform experimental and computational studies of molecular properties.

CO2: Monitor additives' effects and interpret spectral transitions.

CO3: Analyse separation efficiency using chromatographic and spectroscopic methods.

CO4: Measure physicochemical parameters through titrimetric and conductometric techniques.

CO5: Demonstrate principles of enzyme kinetics and molecular visualization.

MAPPING OF COs WITH POs AND PSOs

COURSE OUTCOMES	PROGRAMME OUTCOMES								PROGRAMME SPECIFIC OUTCOMES		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	2	2	2	2	1	2	3	3	3	3
CO2	3	1	2	1	2	1	2	2	3	3	2
CO3	3	2	2	1	2	1	2	3	3	3	2
CO4	3	1	2	1	2	1	2	3	3	3	2
CO5	3	2	2	2	2	1	2	2	3	3	3

1. LOW 2. MODERATE 3. SUBSTANTIAL

DSE-1: Biophysical Chemistry & Instrumentation

COURSE OUTCOMES:

After completion of the course, the students will be able to:

CO1: Summarize structural hierarchy of proteins and other macromolecules.

CO2: Generate models explaining enzyme catalysis and protein folding.

CO3: Estimate thermodynamic stability of folded versus unfolded proteins.

CO4: Inspect experimental methods for probing biological macromolecular interactions.

CO5: Demonstrate biophysical principles in enzyme and protein studies.

MAPPING OF COs WITH POs AND PSOs

COURSE OUTCOMES	PROGRAMME OUTCOMES								PROGRAMME SPECIFIC OUTCOMES		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	2	2	2	2	1	2	1	1	2	1
CO2	3	3	3	2	3	1	2	1	2	2	2
CO3	3	3	3	3	3	1	2	3	3	2	2
CO4	3	3	2	2	3	1	2	2	2	3	1
CO5	3	3	3	3	3	2	2	3	3	3	3

1. LOW 2. MODERATE 3. SUBSTANTIAL

SEMESTER-III

CC-11: Inorganic Chemistry IV

COURSE OUTCOMES:

After completion of the course, the students will be able to:

CO1: Interpret catalytic mechanisms and electroanalytical process fundamentals.

CO2: Formulate innovative catalytic pathways for industrial applications.

CO3: Validate electroanalytical methods for accurate quantitative analysis.

CO4: Examine structural differences between cement and ceramic materials.

CO5: Utilize homogeneous catalysis concepts in real-world industries.

MAPPING OF COs WITH POs AND PSOs

COURSE OUTCOMES	PROGRAMME OUTCOMES								PROGRAMME SPECIFIC OUTCOMES		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	2	2	2	2	1	2	1	1	2	1
CO2	3	3	3	2	3	1	2	1	2	2	2
CO3	3	3	3	3	3	1	2	3	3	2	2
CO4	3	3	2	2	3	1	2	2	2	3	1
CO5	3	3	3	3	3	2	2	3	3	3	3

1. LOW 2. MODERATE 3. SUBSTANTIAL

CC-12: Organic Chemistry-IV

COURSE OUTCOMES:

After completion of the course, the students will be able to:

CO1: Illustrate structural features of nucleic acids and proteins.

CO2: Generate novel biomolecular models integrating carbohydrate chemistry.

CO3: Verify structural validity of natural products using data.

CO4: Compare functional roles of amino acids and nucleotides.

CO5: Implement carbohydrate chemistry concepts in biological systems.

MAPPING OF COs WITH POs AND PSOs

COURSE OUTCOMES	PROGRAMME OUTCOMES								PROGRAMME SPECIFIC OUTCOMES		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	2	2	2	2	1	2	1	1	2	1
CO2	3	3	3	2	3	1	2	1	2	2	2
CO3	3	3	3	3	3	1	2	3	3	2	2
CO4	3	3	2	2	3	1	2	2	2	3	1
CO5	3	3	3	3	3	2	2	3	3	3	3

1. LOW 2. MODERATE 3. SUBSTANTIAL

CC-13: Physical Chemistry III

COURSE OUTCOMES:

After completion of the course, the students will be able to:

CO1: Explain reaction kinetics and interfacial phenomena in chemistry.

CO2: Devise models for nanoparticle behavior in chemical systems.

CO3: Assess stability of polymers and solid-state structures.

CO4: Investigate kinetic data to derive reaction rate laws.

CO5: Employ interfacial chemistry concepts in material science applications.

MAPPING OF COs WITH POs AND PSOs

COURSE OUTCOMES	PROGRAMME OUTCOMES								PROGRAMME SPECIFIC OUTCOMES		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	2	2	2	2	1	2	1	1	2	1
CO2	3	3	3	2	3	1	2	1	2	2	2
CO3	3	3	3	3	3	1	2	3	3	2	2
CO4	3	3	2	2	3	1	2	2	2	3	1
CO5	3	3	3	3	3	2	2	3	3	3	3

1. LOW 2. MODERATE 3. SUBSTANTIAL

CC-14: Physical Chemistry-IV

COURSE OUTCOMES:

After completion of the course, the students will be able to:

CO1: Describe classification, configuration and applications of polymers.

CO2: Construct innovative nanomaterial models for targeted applications.

CO3: Appraise polymerisation methods for efficiency and sustainability.

CO4: Dissect structural differences influencing polymer material properties.

CO5: Implement nanotechnology principles in real-world material design.

MAPPING OF COs WITH POs AND PSOs

COURSE OUTCOMES	PROGRAMME OUTCOMES								PROGRAMME SPECIFIC OUTCOMES		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	2	2	2	2	1	2	1	1	2	1
CO2	3	3	3	2	3	1	2	1	2	2	2
CO3	3	3	3	3	3	1	2	3	3	2	2
CO4	3	3	2	2	3	1	2	2	2	3	1
CO5	3	3	3	3	3	2	2	3	3	3	3

1. LOW 2. MODERATE 3. SUBSTANTIAL

CC-15: Inorganic Chemistry II and Physical Chemistry II Lab

COURSE OUTCOMES:

After completion of the course, the students will be able to:

CO1: Perform synthesis and characterization of inorganic and nanomaterials.

CO2: Evaluate purity and redox behavior using analytical techniques.

CO3: Identify ligand coordination by analyzing spectral and electrochemical data.

CO4: Determine physicochemical parameters using titrimetric and spectroscopic methods.

CO5: Demonstrate principles of inorganic synthesis and instrumental techniques.

COURSE OUTCOMES	PROGRAMME OUTCOMES								PROGRAMME SPECIFIC OUTCOMES		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	2	2	2	2	1	2	1	1	2	1
CO2	3	3	3	2	3	1	2	1	2	2	2
CO3	3	3	3	3	3	1	2	3	3	2	2
CO4	3	3	2	2	3	1	2	2	2	3	1
CO5	3	3	3	3	3	2	2	3	3	3	3

MAPPING OF COs WITH POs AND PSOs

1. LOW 2. MODERATE 3. SUBSTANTIAL

SEMESTER-IV

Project: Chemistry Master Project / Dissertation

Bloom's Taxonomy Verbs:

Remember (BT1)	Understand (BT2)	Apply (BT3)	Analyze (BT4)	Evaluate (BT5)	Create (BT6)
Cite	Add	Acquire	Analyze	Appraise	Abstract
Define	Approximate	Adapt	Audit	Assess	Animate
Describe	Articulate	Allocate	Blueprint	Compare	Arrange
Draw	Associate	Alphabetize	Breadboard	Conclude	Assemble
Enumerate	Characterize	Apply	Break down	Contrast	Budget
Identify	Clarify	Ascertain	Characterize	Counsel	Categorize
Index	Classify	Assign	Classify	Criticize	Code
Indicate	Compare	Attain	Compare	Critique	Combine
Label	Compute	Avoid	Confirm	Defend	Compile
List	Contrast	Back up	Contrast	Determine	Compose
Match	Convert	Calculate	Correlate	Discriminate	Construct
Meet	Defend	Capture	Detect	Estimate	Cope
Name	Describe	Change	Diagnose	Evaluate	Correspond
Outline	Detail	Classify	Diagram	Explain	Create
Point	Differentiate	Complete	Differentiate	Grade	Cultivate
Quote	Discuss	Compute	Discriminate	Hire	Debug
Read	Distinguish	Construct	Dissect	Interpret	Depict
Recall	Elaborate	Customize	Distinguish	Judge	Design
Recite	Estimate	Demonstrate	Document	Justify	Develop
Recognize	Example	Depreciate	Ensure	Measure	Devise
Record	Explain	Derive	Examine	Predict	Dictate
Repeat	Express	Determine	Explain	Prescribe	Enhance
Reproduce	Extend	Diminish	Explore	Rank	Explain
Review	Extrapolate	Discover	Figure out	Rate	Facilitate
Select	Factor	Draw	File	Recommend	Format
State	Generalize	Employ	Group	Release	Formulate
Study	Give	Examine	Identify	Select	Generalize
Tabulate	Infer	Exercise	Illustrate	Summarize	Generate
Trace	Interact	Explore	Infer	Support	Handle
Write	Interpolate	Expose	Interrupt	Test	Import
	Interpret	Express	Inventory	Validate	Improve
	Observe	Factor	Investigate	Verify	Incorporate
	Paraphrase	Figure	Layout		Integrate
	Picture graphically	Graph	Manage		Interface
	Predict	Handle	Maximize		Join
	Review	Illustrate	Minimize		Lecture
	Rewrite	Interconvert	Optimize		Model
	Subtract	Investigate	Order		Modify
	Summarize	Manipulate	Outline		Network
	Translate	Modify	Point out		Organize
	Visualize	Operate	Prioritize		Outline
		Personalize	Proofread		Overhaul
		Plot	Query		Plan
		Practice	Relate		Portray
		Predict	Select		Prepare
		Prepare	Separate		Prescribe

		Price	Subdivide		Produce
		Process	Train		Program
		Produce	Transform		Rearrange
		Project			Reconstruct
		Provide			Relate
		Relate			Reorganize
		Round off			Revise
		Sequence			Rewrite
		Show			Specify
		Simulate			Summarize
		Sketch			
		Solve			
		Subscribe			
		Tabulate			
		Transcribe			
		Translate			
		Use			