

SADAKATHULLAH APPA COLLEGE

(AUTONOMOUS)

(Reaccredited by NAAC with an 'A' Grade with a CGPA of 3.40 out of 4.00 in the III cycle An ISO 9001:2015 Certified Institution)

RAHMATH NAGAR, TIRUNELVELI- 11.

Tamilnadu



CBCS SYLLABUS

For

M.Sc. CHEMISTRY

**(As per the Resolutions of the Academic Council Meeting held on
03.03.2018 & 17.10.2018)**

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(Applicable for students admitted in June 2018 and onwards)**Department of Chemistry (PG)****CBCS Syllabus – M.Sc., Chemistry (2018-19 onwards)**

Sem	P	Title of the Paper	Sub. Code	H/W	C	Marks		
						I	E	T
I	DSC1	INORGANIC CHEMISTRY – I	18PCCH11	6	4	25	75	100
	DSC2	ORGANIC CHEMISTRY – I	18PCCH12	6	4	25	75	100
	DSC3	PHYSICAL CHEMISTRY – I	18PCCH13	6	4	25	75	100
	DSE1A	CHROMATOGRAPHY	18PECH1A	4	4	25	75	100
	DSE1B	BIOCHEMISTRY	18PECH1B					
	P-I	INORGANIC CHEMISTRY PRACTICAL – I	18PCCH1P1	4	2	40	60	100/2
P-II	PHYSICAL CHEMISTRY PRACTICAL – I	18PCCH1P2	4	2	40	60	100/2	
II	DSC4	INORGANIC CHEMISTRY – II	18PCCH21	5	4	25	75	100
	DSC5	ORGANIC CHEMISTRY – II	18PCCH22	5	4	25	75	100
	DSC6	PHYSICAL CHEMISTRY – II	18PCCH23	5	4	25	75	100
	DSE2A	APPLIED CHEMISTRY	18PECH2A	4	4	25	75	100
	DSE2B	CHEMINFORMATICS	18PECH2B					
	P-III	ORGANIC CHEMISTRY PRACTICAL – I	18PCCH2P1	4	2	40	60	100/2
	P-IV	CHROMATOGRAPHY PRACTICAL	18PCCH2P2	4	2	40	60	100/2
	IDC-1	INDUSTRIAL CHEMISTRY	18PICH21	3	3	25	75	100
III	DSC7	INORGANIC CHEMISTRY – III	18PCCH31	5	4	25	75	100
	DSC8	ORGANIC CHEMISTRY – III	18PCCH32	5	4	25	75	100
	DSC9	PHYSICAL CHEMISTRY – III	18PCCH33	5	4	25	75	100
	DSE3A	INSTRUMENTAL METHODS OF ANALYSIS	18PECH3A	4	4	25	75	100
	DSE3B	ENZYME CHEMISTRY	18PECH3B					
	P-V	ORGANIC CHEMISTRY PRACTICAL – II	18PCCH3P1	4	2	40	60	100/2
	P-VI	PHYSICAL CHEMISTRY PRACTICAL-II	18PCCH3P2	4	2	40	60	100/2
	IDC-2	INTRODUCTION TO CHEMINFORMATICS	18PICH31	3	3	25	75	100
	IV	DSC10	SPECTROSCOPY	18PCCH41	5	4	25	75
DSC11		ADVANCED TOPICS IN CHEMISTRY	18PCCH42	5	4	25	75	100
DSC12		PROJECT	18PCCH43	8	8			100
DSE4A		MEDICINAL CHEMISTRY	18PECH4A	4	4	25	75	100
DSE4B		RATIONAL DRUG DESIGN	18PECH4B					
P-VII		INORGANIC CHEMISTRY	18PCCH4P1	4	2	40	60	100/2

(Applicable for students admitted in June 2018 and onwards)

Department of Chemistry (PG)

CBCS Syllabus – M.Sc., Chemistry (2018-19 onwards)

Sem	P	Title of the Paper	Sub. Code	H/W	C	Marks		
						I	E	T
		PRACTICAL II						
	P-VIII	GREEN CHEMISTRY PRACTICAL	18PCCH4P2	4	2	40	60	100/2
Total				120	90			2200

PO - No.	Upon completion of M. Sc., Degree program, the post graduates will be able to:
PO-1	Understand the fundamentals and application of chemical and scientific theories in Inorganic, Organic, Physical and Biological chemistry.
PO-2	Build in the skills of problem solving, critical thinking and analytical reasoning from handling the scientific problems.
PO-3	Create an appropriate model, formulate a hypothesis, choose an appropriate set of tools and techniques and design an experiment that tests the hypothesis and analyze the results from the experiment based on sound scientific conclusions from the results obtained.
PO-4	Understand the role of science in the society and imbibe ethical values of safe handling of chemicals, environmental issues and key issues that the society is facing in energy, health and medicine.
PO-5	Analyze the practical problems and think creatively to generate innovative solutions using appropriate technologies.
PO-6	Develop the interpersonal skills to function cooperatively in a team setting.
PO-7	Apply effective scientific communication in oral and writing, for scientific concepts, proposals and monographs, <i>etc.</i> ,

PSO – No.	Upon completion of M. Sc., Chemistry Degree program, the post graduates will be able to:	PO Mapped
PSO-1	Develop broad set of chemical concepts concerning the fundamentals in the basic areas of the discipline (Organic, Inorganic, Physical and Analytical chemistry).	PO-1
PSO-2	Understand the chemical reactions, structures and properties.	PO-2
PSO-3	Apply the knowledge of fundamentals of chemistry to find the solution for chemical problems.	PO-3
PSO-4	Formulate hypotheses and assess the chemical concepts using skills learnt in laboratories to perform experiments, collect data, compile and interpret results and draw reasonable and logical conclusions.	PO-4
PSO-5	Apply the skills in handling, synthesizing, purifying and characterizing new and existing chemicals which include knowing the proper procedures and regulations for the safe handling, use and disposal of chemicals.	PO-5
PSO-6	Develop appropriate techniques, resources and modern software tools including prediction and modelling to chemical science activities.	PO-7
PSO-7	Understand the benefits and impacts in the society and apply it as a basis for ethical behaviour in solving the problems faced by the chemists. Safe handle the chemicals, solve environmental issues and key issues of the society regarding energy, health and medicine.	PO-4
PSO-8	Develop the ability to function as an individual and member of an interdisciplinary problem solving team.	PO-6

Course	Details			
Code	18PCCH11			
Title	INORGANIC CHEMISTRY-I			
Degree	M. Sc.,			
Branch(s)	Chemistry			
Year/Semester	I		I	
Type	Core			
Credits	4			
No. of Contact Hours	Total Hours	90	Hours/Week	6

CO-No.	Upon completion of this course, students will be able to:	PSO addressed	Cognitive Level
CO-1	Understand and categorise the types of crystal structure.	PSO-1	Understanding
CO-2	Construct the molecular orbital diagram for Homo, Hetero and polyatomic molecules.	PSO-3	Applying
CO-3	Analyze the stereochemical properties of coordination complexes.	PSO-4	Analyzing
CO-4	Understanding the crystal field theory and its splitting behaviour.	PSO-6	Understanding
CO-5	Interpret the stability of coordination complexes.	PSO-5	Evaluating

Course	Details			
Code	18PCCH12			
Title	ORGANIC CHEMISTRY – I			
Degree	M. Sc.,			
Branch(s)	Chemistry			
Year/Semester	I		I	
Type	Core			
Credits	4			
No. of Contact Hours	Total Hours	90	Hours/Week	6

CO-No.	Upon completion of the course, students will able to:	PSO addressed	Cognitive Level
CO – 1	Understand the reactions and mechanisms.	PSO-1	Understanding
CO – 2	Apply suitable oxidising and reducing reagents for different organic reactions.	PSO-1,2	Applying
CO – 3	Apply suitable organic reagents for designing organic transformations in organic compounds.	PSO-7	Applying
CO – 4	Explain the reaction mechanism for organic reactions.	PSO-2	Understanding, Evaluating
CO – 5	Interpret the ring structure and stability.	PSO-3	Evaluating

Course	Details			
Code	18PCCH13			
Title	PHYSICAL CHEMISTRY – I			
Degree	M. Sc.,			
Branch(s)	Chemistry			
Year/Semester	I		I	
Type	Core			
Credits	4			
No. of Contact Hours	Total Hours	90	Hours/Week	6

CO-No.	Upon completion of this course, students will be able to:	PSO addressed	Cognitive Level
CO-1	Understand and explain the concept of thermodynamics properties.	PSO-1,7	Understanding
CO-2	Apply the concept of irreversible thermodynamics to systems.	PSO-2	Applying
CO-3	Explain the activated complex theories and rate constant.	PSO-3	Understanding, Evaluating
CO-4	Interpret the properties of wave function.	PSO-8	Evaluating
CO-5	Apply Schrodinger equations to different systems and find solutions.	PSO-5	Applying

Course	Details			
Code	18PECH1A			
Title	CHROMATOGRAPHY			
Degree	M. Sc.,			
Branch(s)	Chemistry			
Year/Semester	I		I	
Type	Elective			
Credits	4			
No. of Contact Hours	Total Hours	60	Hours/Week	4

CO-No.	Upon completion of this course, students will be able to:	PSO addressed	Cognitive Level
CO-1	Explain the chromatographic techniques.	PSO-1	Understanding, Evaluating
CO-2	Illustrate the principle and uses of thin layer chromatography.	PSO-4	Understanding
CO-3	Compare the cation and anion exchange resins in ion exchange chromatography.	PSO-6	Understanding
CO-4	Interpret the stationary and mobile phase in high performance liquid chromatography.	PSO-3,6	Evaluating
CO-5	Summarize the techniques and applications of gas chromatography.	PSO-8	Understanding

Course	Details			
Code	18PECH1B			
Title	BIOCHEMISTRY			
Degree	M. Sc.,			
Branch(s)	Chemistry			
Year/Semester	I		I	
Type	Elective			
Credits	4			
No. of Contact Hours	Total Hours	60	Hours/Week	4

CO-No.	Upon completion of the course, students will able to:	PSO addressed	Cognitive Level
CO- 1	Identify the structures of carbohydrates.	PSO-1,2	Applying
CO - 2	Classify the amino acids and proteins	PSO-1,3	Understanding
CO - 3	Classify different lipids and understand its biological functions	PSO-4	Understanding
CO – 4	Outline the structures and functions of nucleic acid	PSO-6	Understanding
CO – 5	Explain the metabolic reactions.	PSO-8	Understanding, Evaluating

Course	Details			
Code	18PCCH1P1			
Title	INORGANIC CHEMISTRY PRACTICAL - I			
Degree	M. Sc.,			
Branch(s)	Chemistry			
Year/Semester	I		I	
Type	Core Practical			
Credits	2			
No. of Contact Hours	Total Hours	60	Hours/Week	4

CO-No.	Upon completion of this course, students will be able to:	PSO addressed	Cognitive Level
CO-1	Determine the less familiar cations in semi micro analysis.	PSO-3,4	Evaluating
CO-2	Analyze the familiar cations in the salt mixture.	PSO-6,7	Analyzing
CO-3	Design the estimation of inorganic elements by complexometric titration.	PSO-8	Creating
CO-4	Outline the methods of analysis.	PSO-4	Understanding
CO-5	Design the methods for analyzing the salt mixtures.	PSO-3	Creating

Course	Details			
Code	18PCCH1P2			
Title	PHYSICAL CHEMISTRY PRACTICAL I			
Degree	M. Sc.,			
Branch(s)	Chemistry			
Year/Semester	I		I	
Type	Core Practical			
Credits	2			
No. of Contact Hours	Total Hours	60	Hours/Week	4

CO-No.	Upon completion of this course, students will be able to:	PSO addressed	Cognitive Level
CO-1	Estimate the strength of strong and weak acids, weak bases, FAS and KMnO_4 by conductometric and potentiometric titrations.	PSO-3,4	Evaluating
CO-2	Find the dissociation constant of weak acid by conductometric and potentiometric experiments.	PSO-6,7	Remembering
CO-3	Determine the order of saponification of ester by half-life method.	PSO-8	Evaluating
CO-4	Outline the methods of analysis.	PSO-4	Understanding
CO-5	Design the methods for determining the physical constants using electrical instruments.	PSO-3	Creating

Course	Details			
Code	18PCCH21			
Title	INORGANIC CHEMISTRY – II			
Degree	M. Sc.,			
Branch(s)	Chemistry			
Year/Semester	I	II		
Type	Core			
Credits	4			
No. of Contact Hours	Total Hours	75	Hours/Week	5

CO-No.	Upon completion of the course, students will able to:	PSO addressed	Cognitive Level
CO - 1	Outline the various reactions in coordination complexes.	PSO-1,2	Analyzing
CO - 2	Interpret the spectra of complexes.	PSO-6	Understanding
CO - 3	Identify the structure of metal carbonyls and clusters.	PSO-2	Remembering
CO - 4	Understand the structure and geometry of interhalogen compounds.	PSO-7	Understanding
CO - 5	Explain the nuclear fission, fusion reactions and understand the radiation hazards.	PSO-8	Understanding, Evaluating

Course	Details			
Code	18PCCH22			
Title	ORGANIC CHEMISTRY II			
Degree	M. Sc.,			
Branch(s)	Chemistry			
Year/Semester	I	II		
Type	Core			
Credits	4			
No. of Contact Hours	Total Hours	75	Hours/Week	5

CO. No.	Upon completion of the course, students will able to:	PSO addressed	Cognitive Level
CO-1	Explain the basic idea about stereochemistry.	PSO-3	Understanding, Evaluating
CO-2	Find out the mechanism for various name reactions.	PSO-4	Remembering
CO-3	Outline the reactions of heterocyclic compounds.	PSO-7	Understanding
CO-4	Design the thermal and photochemical reactions.	PSO-3	Creating
CO-5	Construct the mechanism for molecular rearrangements reactions.	PSO-3	Applying, Creating

Course	Details			
Code	18PCCH23			
Title	PHYSICAL CHEMISTRY – II			
Degree	M. Sc.,			
Branch(s)	Chemistry			
Year/Semester	I	II		
Type	Core			
Credits	4			
No. of Contact Hours	Total Hours	75	Hours/Week	5

CO-No.	Upon completion of this course, students will be able to:	PSO addressed	Cognitive Level
CO-1	Understand the phase rule and colloids.	PSO-1,2	Understanding
CO-2	Explain the concept of electrochemistry.	PSO-3	Understanding, Evaluating
CO-3	Illustrate the kinetics of electrode reactions.	PSO-4,5	Understanding
CO-4	Construct character table for various point group.	PSO-8	Creating
CO-5	Apply the group theory to various molecules	PSO-1,4	Applying

Course	Details			
Code	18PECH2A			
Title	APPLIED CHEMISTRY			
Degree	M. Sc.,			
Branch(s)	Chemistry			
Year/Semester	I	II		
Type	Elective			
Credits	4			
No. of Contact Hours	Total Hours	60	Hours/Week	4

CO-No.	Upon completion of this course, students will be able to:	PSO addressed	Cognitive Level
CO-1	Illustrate the types of fuel cells.	PSO-1	Understanding
CO-2	Design the techniques of fermentation process.	PSO-4	Creating
CO-3	Analyse the extraction and properties of oils, fats and waxes.	PSO-6	Analysing
CO-4	Outline the importance and applications of insecticides and pesticides.	PSO-1,2	Understanding
CO-5	List out the applications of paints and its functions.	PSO-8	Analysing

Course	Details			
Code	18PECH2B			
Title	CHEMINFORMATICS			
Degree	M. Sc.,			
Branch(s)	Chemistry			
Year/Semester	I	II		
Type	Elective			
Credits	4			
No. of Contact Hours	Total Hours	60	Hours/Week	4

CO-No.	Upon completion of the course, students will able to:	PSO addressed	Cognitive Level
CO-1	Explain the 2d-molecular structure with the aid of computer.	PSO-1,2	Understanding, Evaluating
CO-2	Understand the characteristics and categories of databases.	PSO-4	Understanding
CO-3	Analyze the databases and data source in chemistry.	PSO-3,6	Analyzing
CO-4	Develop new 3D and chirality descriptors.	PSO-7	Creating
CO-5	Predict the spectral properties and design combinatorial libraries in cheminformatics.	PSO-8	Creating

Course	Details			
Code	18PCCH2P1			
Title	ORGANIC CHEMISTRY PRACTICAL – I			
Degree	M. Sc.,			
Branch(s)	Chemistry			
Year/Semester	I	II		
Type	Core Practical			
Credits	2			
No. of Contact Hours	Total Hours	60	Hours/Week	4

CO-No.	Upon completion of the course, students will able to:	PSO addressed	Cognitive Level
CO-1	Analyze the organic compounds qualitatively.	PSO-1,2	Analyzing
CO-2	Design the preparation and analysis of organic compounds.	PSO-3,7	Creating
CO-3	Predict the functional groups of the organic compounds.	PSO-3	Creating
CO-4	Outline the methods of the analysis.	PSO-4	Understanding
CO-5	Design the methods for determining the functional groups.	PSO-3	Creating

Course	Details			
Code	18PCCH2P2			
Title	CHROMATOGRAPHY PRACTICAL			
Degree	M. Sc.,			
Branch(s)	Chemistry			
Year/Semester	I	II		
Type	Core Practical			
Credits	2			
No. of Contact Hours	Total Hours	60	Hours/Week	4

CO-No.	Upon completion of this course, students will be able to:	PSO addressed	Cognitive Level
CO-1	Explain the chromatographic separation of organic compounds.	PSO-4,6	Understanding, Evaluating
CO-2	Find the R_f values for the separation of cadmium, zinc, red and blue inks.	PSO-7,8	Remembering
CO-3	Interpret the TLC separation of inorganic compounds.	PSO-8	Understanding
CO-4	Outline the methods of analysis.	PSO-4	Understanding
CO-5	Design the methods for determining the components in the mixture using appropriate chromatographic techniques.	PSO-3	Creating

Course	Details			
Code	18PCCH31			
Title	INORGANIC CHEMISTRY – III			
Degree	M. Sc.,			
Branch(s)	Chemistry			
Year/Semester	II	III		
Type	Core			
Credits	4			
No. of Contact Hours	Total Hours	75	Hours/Week	5

CO-No.	Upon completion of the course, students will be able to:	PSO addressed	Cognitive Level
CO-1	Outline the preparation and properties of organometallic compounds.	PSO-1,3	Understanding
CO-2	Explain the organic transformations using organo metallic catalyst.	PSO-2	Understanding, Evaluating
CO-3	Outline the structure and functional of metalloproteins	PSO-4,5	Understanding
CO-4	Analyze the different structures and reactions of metalloproteins.	PSO-6,7	Analyzing
CO-5	Explain the synthetic methods, chemical behaviour and characterization of transition metal and hydrogen compounds.	PSO-1,2	Understanding, Evaluating

Course	Details			
Code	18PCCH32			
Title	ORGANIC CHEMISTRY – III			
Degree	M. Sc.,			
Branch(s)	Chemistry			
Year/Semester	II	III		
Type	Core			
Credits	4			
No. of Contact Hours	Total Hours	75	Hours/Week	5

CO-No.	Upon completion of the course, students will able to:	PSO addressed	Cognitive Level
CO - 1	Illustrate the orbital interactions and orbital symmetry correlations of various pericyclic reactions.	PSO-1,2	Understanding
CO - 2	Analyze the structure and synthesis route for various alkaloids.	PSO-3,4	Analyzing
CO - 3	Predict the structures of steroids and terpenoids.	PSO-5	Creating
CO - 4	Explain the fat and water soluble vitamins.	PSO-1,2	Understanding, Evaluating
CO - 5	Design the synthetic route and disconnection approach of various organic molecules.	PSO-8	Creating

Course	Details			
Code	18PCCH33			
Title	PHYSICAL CHEMISTRY – III			
Degree	M. Sc.,			
Branch(s)	Chemistry			
Year/Semester	II	III		
Type	Core			
Credits	4			
No. of Contact Hours	Total Hours	75	Hours/Week	5

CO- No.	Upon completion of this course, students will be able to:	PSO addressed	Cognitive Level
CO-1	Outline the different photochemical processes.	PSO-1	Understanding
CO-2	Explain the theory and principle of statistical thermodynamics.	PSO-4	Understanding, Evaluating
CO-3	Outline the basic concept of statistical thermodynamics	PSO-1	Understanding
CO-4	Apply quantum mechanics concept to hydrogen and helium.	PSO-1,8	Applying
CO-5	Analyse the various approximation method of quantum chemistry.	PSO-8	Analysing

Course	Details			
Code	18PECH3A			
Title	INSTRUMENTAL METHODS OF ANALYSIS			
Degree	M. Sc.,			
Branch(s)	Chemistry			
Year/Semester	II	III		
Type	Elective			
Credits	4			
No. of Contact Hours	Total Hours	60	Hours/Week	4

CO-No.	Upon completion of this course, students will be able to:	PSO addressed	Cognitive Level
CO-1	Explain the principle and application of thermo-analytical methods.	PSO-1	Understanding, Evaluating
CO-2	Analyze the various electro-analytical methods	PSO-2	Analyzing
CO-3	Explain the spectrophotometric analysis and its applications.	PSO-4	Understanding, Evaluating
CO-4	Illustrate the principle, instrumentation and applications of Flurometry, Flame photometry, Nephelometry and Atomic absorption Spectroscopy.	PSO-1	Understanding, Evaluating
CO-5	Outline the principle and instrumentation of NMR, PES and Medical Imaging techniques.	PSO-1,8	Understanding

Course	Details			
Code	18PECH3B			
Title	ENZYME CHEMISTRY			
Degree	M. Sc.,			
Branch(s)	Chemistry			
Year/Semester	II	III		
Type	Elective			
Credits	4			
No. of Contact Hours	Total Hours	60	Hours/Week	4

CO-No.	Upon completion of this course, students will be able to:	PSO addressed	Cognitive Level
CO-1	Explain the classification, nomenclature and purification of enzymes.	PSO-6	Understanding, Evaluating
CO-2	Design the kinetics and mechanism of enzyme catalyzed reactions.	PSO-1,2	Creating
CO-3	Analyze the mechanism of enzyme catalyzed reactions.	PSO-4	Analyzing
CO-4	Evaluate the structure and function of multiple enzyme complexes.	PSO-7	Evaluating
CO-5	Outline the industrial application of extremozymes.	PSO-8	Understanding

Course	Details			
Code	18PCCH3P1			
Title	ORGANIC CHEMISTRY PRACTICAL – II			
Degree	M. Sc.,			
Branch(s)	Chemistry			
Year/Semester	II	III		
Type	Core Practical			
Credits	2			
No. of Contact Hours	Total Hours	60	Hours/Week	4

CO-No.	Upon completion of the course, students will able to:	PSO addressed	BT
CO-1	Outline the preparation of organic compounds.	PSO-2,4	Understanding
CO-2	Analyze the different stages of preparation of compounds.	PSO-5,7	Analyzing
CO-3	Design new methods of synthesis.	PSO-3	Creating
CO-4	Outline the methods of analysis.	PSO-4	Understanding
CO-5	Estimate the organic compounds using different methods.	PSO-3	Evaluating, Creating

Course	Details			
Code	18PCCH3P2			
Title	PHYSICAL CHEMISTRY PRACTICAL II			
Degree	M. Sc.,			
Branch(s)	Chemistry			
Year/Semester	II	III		
Type	Core Practical			
Credits	2			
No. of Contact Hours	Total Hours	60	Hours/Week	4

CO-No.	Upon completion of this course, students will be able to:	PSO addressed	Cognitive Level
CO-1	Analyze Ostwald's dilution law and Primary salt effect.	PSO-1,2	Analyzing
CO-2	Explain the kinetics of Persulphate-iodide reaction.	PSO-4	Understanding, Evaluating
CO-3	Determine the heat of solution of naphthalene – toluene, oxalic acid – water and ammonium oxalate – water systems.	PSO-8	Evaluating
CO-4	Analyze the adsorption process and determine the unknown concentration.	PSO-7	Analyzing
CO-5	Estimate the partial molar volume of solute and analyze the stoichiometry, stability constant of inorganic and organic complexes.	PSO-8	Evaluating, Creating

Course	Details			
Code	18PCCH41			
Title	SPECTROSCOPY			
Degree	M. Sc.,			
Branch(s)	Chemistry			
Year/Semester	II	IV		
Type	Core			
Credits	4			
No. of Contact Hours	Total Hours	75	Hours/Week	5

CO-No.	Upon completion of the course, students will able to:	PSO addressed	Cognitive Level
CO - 1	Analyze the spectrum of UV and IR spectroscopy.	PSO-1,3	Analyzing
CO - 2	Interpret the structure of compounds using NMR spectroscopy.	PSO-4	Understanding, Evaluating
CO - 3	Analyze the applications of Mass spectrometry.	PSO-6	Analyzing
CO - 4	Outline the properties and principle of ORD and CD.	PSO-7	Analyzing
CO - 5	Assess the structure of inorganic complexes using NMR, EPR and Mössbauer spectroscopy.	PSO-8	Evaluating

Course	Details			
Code	18PCCH42			
Title	ADVANCED TOPICS IN CHEMISTRY			
Degree	M. Sc.,			
Branch(s)	Chemistry			
Year/Semester	II	IV		
Type	Core			
Credits	4			
No. of Contact Hours	Total Hours	75	Hours/Week	5

CO-No.	Upon completion of this course, students will be able to:	PSO addressed	Cognitive Level
CO-1	Explain the basic concept of green chemistry.	PSO-1,2	Understanding, Evaluating
CO-2	Outline the basic concept of nanochemistry.	PSO-2	Understanding
CO-3	Analyze the concept of supramolecular chemistry.	PSO-4	Analyzing
CO-4	Apply the concept of thermodynamics in biological systems	PSO-7	Applying
CO-5	Apply the database for drug designing.	PSO-8	Applying

Course	Details			
Code	18PCCH43			
Title	PROJECT			
Degree	M. Sc.,			
Branch(s)	Chemistry			
Year/Semester	II	IV		
Type	Core			
Credits	8			
No. of Contact Hours	Total Hours	120	Hours/Week	8

CO-No.	Upon completion of this course, students will be able to:	PSO addressed	Cognitive Level
CO-1	Design new hypothesis, carry out experimental works and analyze the results.	PSO-3	Creating
CO-2	Analyze the scientific problems and find novel solutions.	PSO-4	Analyzing
CO-3	Apply critical thinking and analytical reasoning to scientific problems.	PSO-8	Applying
CO-4	Outline the results in oral, written and electronic formats.	PSO-8	Understanding
CO-5	Experiment with new ideas and new areas of research.	PSO-8	Applying

Course	Details			
Code	18PECH4A			
Title	MEDICINAL CHEMISTRY			
Degree	M. Sc.,			
Branch(s)	Chemistry			
Year/Semester	II	IV		
Type	Elective			
Credits	4			
No. of Contact Hours	Total Hours	60	Hours/Week	4

CO-No.	Upon completion of the course, students will able to:	PSO addressed	Cognitive Level
CO-1	Explain the nomenclature and terminology in drugs.	PSO-1	Understanding, Evaluating
CO-2	Identify the mode of action of sedatives and hypnotics.	PSO-2,3	Applying
CO-3	Explain the mechanism of autonomic drugs.	PSO-5	Understanding, Evaluating
CO-4	Illustrate the structure and functional of diuretics	PSO-7	Understanding
CO-5	Elaborate the mechanism of antihistamine and anti-parkinsonism drugs.	PSO-8	Creating

Course	Details			
Code	18PECH4B			
Title	RATIONAL DRUG DESIGN			
Degree	M. Sc.,			
Branch(s)	Chemistry			
Year/Semester	II	IV		
Type	Elective			
Credits	4			
No. of Contact Hours	Total Hours	60	Hours/Week	4

CO-No.	Upon completion of the course, students will able to:	PSO addressed	BT
CO – 1	Identify the different routes of drug administration.	PSO-3	Applying
CO – 2	Illustrate the action of drugs.	PSO-5	Understanding
CO – 3	Outline the chemical structure and pharmacologic activity in a quantitative manner.	PSO-8	Understanding
CO – 4	Design the binding affinity between molecules in drug design.	PSO-8	Creating
CO – 5	Interpret the interaction of drugs within living organisms.	PSO-7	Evaluating

Course	Details			
Code	18PCCH4P1			
Title	INORGANIC CHEMISTRY PRACTICAL II			
Degree	M. Sc.,			
Branch(s)	Chemistry			
Year/Semester	II		IV	
Type	Core Practical			
Credits	2			
No. of Contact Hours	Total Hours	60	Hours/Week	4

CO-No.	Upon completion of the course, students will able to:	PSO addressed	BT
CO-1	Outline the preparation of inorganic complexes.	PSO-3	Understanding
CO-2	Explain the volumetric analysis of inorganic elements.	PSO-5	Understanding, Evaluating
CO-3	Design the methods of estimation of elements.	PSO-8	Creating
CO-4	Outline the methods of qualitative analysis.	PSO-4	Understanding
CO-5	Design the effective gravimetric estimation methods for inorganic elements.	PSO-3	Creating

Course	Details			
Code	18PCCH4P2			
Title	GREEN CHEMISTRY PRACTICAL			
Degree	M. Sc.,			
Branch(s)	Chemistry			
Year/Semester	II	IV		
Type	Core Practical			
Credits	2			
No. of Contact Hours	Total Hours	60	Hours/Week	4

CO-No.	Upon completion of this course, students will be able to:	PSO addressed	BT
CO-1	Outline the preparation of organic and inorganic compounds using green chemistry.	PSO-7,8	Understanding
CO-2	Make use of green techniques to identify radicals.	PSO-8	Applying
CO-3	Test N, S, Cl, Br and I using green chemistry.	PSO-6	Creating, Evaluating
CO-4	Design new methods of preparation of organic compounds using green chemistry.	PSO-3	Creating
CO-5	Categorize the chemicals as hazardous and safer to use.	PSO-4	Analyzing

Course	Details			
Code	18PICH21			
Title	INDUSTRIAL CHEMISTRY			
Degree	M. Sc.,			
Branch(s)	Chemistry			
Year/Semester	I	II		
Type	IDC			
Credits	3			
No. of Contact Hours	Total Hours	45	Hours/Week	3

CO-No.	Upon completion of this course, students will be able to:	PSO addressed	BT
CO-1	Explain the extraction, properties and uses of different metals.	PSO-1,3	Understanding, Evaluating
CO-2	Outline the manufacturing process of cement.	PSO-5	Understanding
CO-3	Outline the composition preparation and uses of matchbox, explosives and propellants.	PSO-4	Understanding
CO-4	Analyse the preparation of day to day articles.	PSO-4	Analysing
CO-5	Outline the synthesis and properties of petrochemicals.	PSO-2	Understanding

Course	Details			
Code	18PICH31			
Title	INTRODUCTION TO CHEMINFORMATICS			
Degree	M. Sc.,			
Branch(s)	Chemistry			
Year/Semester	II	III		
Type	IDC			
Credits	3			
No. of Contact Hours	Total Hours	45	Hours/Week	3

CO-No.	Upon completion of the course, students will able to:	PSO addressed	BT
CO-1	Explain the 2D, 3D molecular structures and basics of cheminformatics.	PSO-1,2	Understanding, Evaluating
CO-2	Classify the different database and data sources in chemistry.	PSO-4	Analyzing
CO-3	Outline the applications of chemical information searches.	PSO-5	Understanding
CO-4	Assess the various types of molecular descriptor.	PSO-8	Evaluating
CO-5	Apply novel methods in drug designing and analyzing the pharmacokinetics action of drug on human body.	PSO-8	Applying