FATIMA COLLEGE (AUTONOMOUS), MADURAI – 625018

2020 - 2021

NAME OF THE PROGRAMME: B.SC CHEMISTRY **PROGRAM CODE: UACH**

PROGRAM OUTCOME

- Have firm foundations in the fundamentals and application of current chemical and scientific theories.
- Are skilled in problem solving, critical thinking and analytical reasoning.
- Are able to identify and solve chemical problems and explore new areas of research.
- Are able to communicate the results of their work to chemists and non-chemists.
- Students will be able to explain that chemistry is an integral part in addressing social, economic, and environmental problems.
- Students turn out to be globally competent there by establishing themselves as attractive professionals.

PROGRAMME SPECIFIC OUTCOMES:

PSO1: Thorough understanding of all basic concepts and theories pertaining to Chemistry

PSO2: A comprehensive view of bonding, structure, reactivity and stability of chemical species.

PSO3: An overall perspective view of physical principles that govern all physical and chemical transformations .

PSO4: Basic knowledge about instrumentation involving UV, IR, ESR and NMR.

PSO5: Hands on experience of laboratory experiments both qualitative and quantitative

PSO6: Project undertaking enables presentation of results and strengthens the learners in lab to land procedures that nurture societal need and environmental protection.

PSO7: Diversified informative sources that equip learners to enter varied fields.

PSO8: Additional in-puts of using appropriate software related to Chemistry and chemical calculations.

COURSE CODE	COURSE TITLE	COURSE OUTCOMES
19C1CC1	INORGANIC CHEMISTRY -I	1. To comprehend the fundamental properties of atoms, molecules, and the various states of matter 2. To classify the electronic structure of atoms and its influence on chemical 3. To acquire the knowledge of properties, characteristics and application of non-aqueous solvents 4. To recognize the anomalous properties of Li and compares the properties Li with those other alkali metal 5. To illustrate the factors affecting the strength of acid and bases.
19C1CC2	ORGANIC	1.To derive and familiarise the mechanisms of

	CHEMISTRY –I (Reaction mechanism, alkanes, cycloalkanes and alkyl halides)	nucleophilic substitution reactions of organic compounds. organic compound through electron displacement effects 2. Describe the structure and stability of different types of intermediates involved in reaction mechanism. 3. Know the nomenclature, classification of alkanes, alkyl halides.
19C1CC3	VOLUMETRIC ANALYSIS-I	1. To compare the principles behind all types of titrations 2. To identify suitable indicators for a Particular reaction. 3. To prepare solutions of desired concentrations . 4. To apply the principles of volumetric analysis in acid base, ermanganometry and iodometric

		titrations.
19N1ACC1	ALLIED CHEMISTRY-I	1. To predict the geometry of any molecule with the help of VB and VSEPR theory 2. To construct 3. M.O diagram for homonuclear diatomic molecule 4. To categorize the types of organic reactions 5. To describe the chemistry of carbohydrates. 6. To classify the chemical reactions involved in volumetric analysis
19Z1ACC1	ALLIED CHEMISTRY-I	1. To predict the geometry of any molecule with the help of VB and VSEPR theory 2. To construct M.O diagram for homonuclear diatomic molecule 3. To categorize the types of organic reactions

		4. To describe the chemistry of carbohydrates. 5. To classify the chemical reactions involved in volumetric analysis
19C1NME	PROFITABLE HOME INDUSTRIES	1. Demonstrate the preparation of some home products like candle, detergent powder, soap oil, ink , phenoyl and computer sambirani nutrients present in food 2. Gain knowledge about the fundamental chemistry involved in dairy products 3. Determine the manufacture and functions of various soaps and creams 4. Learn the ingredients required for the preparation of various types of shampoos, skin powder, nail polish
19Z1ACC2	ALLIED CHEMISTRY PRACTICALS	1. procedures of various titrimetric methods 2. Identify suitable indicators for a particular

	-I	reaction 3. Know the various terms such as standard solution, normality, molality, molarity, equivalent weight and molecular weight. 4. Select the specific titrimetric method to estimate the amount of analyte present in the given solution 5. Apply the expressions and equations to calculate the strength of solutions
19N1ACC2	ALLIED CHEMISTRY PRACTICALS -I	1. Describe the principles and procedures of various titrimetric methods 2. Identify suitable indicators for a particular reaction 3. Know the various terms such as standard solution, normality, molality, molarity, equivalent weight and molecular weight.

		4. Select the specific titric method to estimate the amount of analyte present in the given solution 5. Apply the expressions and equations to calculate the strength of solutions
19C2CC4	INORGANIC CHEMISTRY –II (Theories of hard and soft acids – bases, chemical bonding and chemistry of group III, IV, V &VI Elements)	1. To categorize the soft, hard and border line acids and bases. 2. To compare Valence bond theory and molecular orbital theory 3. To understand the synthetic importance of organo metallic compounds of Al, B and Si 4. To criticize the chemistry of hydrazine and hydroxyl amine 5. To draw the structure of oxo halides and oxo acids of sulphur.
19C2CC5	ORGANIC	1. Gain a basic knowledge about elimination

	CHEMISTRY –II (Alkenes, Alkynes, Alkadienes, organo metallic compounds, Alcohols and Ethers)	reactions to prepare alkenes 2. Describe the chemical reactions and 3. structure of alkenes Classify the alkadienes and alkynes Choose the specific reagents to prepare various organic compounds from GR 4. Compare the properties of alcohols and ethers
19C2CC6	VOLUMETRIC ANALYSIS-I1	1. To apply the principles of volumetric analysis in various estimations. 2. To estimate the amount of calcium using permangano metric method 3. To estimate the amount of calcium and magnesium using EDTA method. 4. To apply the principle of Argentimetry in the estimation of chloride ions.

		5. To understand the principles behind the estimations of phenol & Aniline iodometrically. reaction 5. To evaluate the types of catalysis and theories of catalysis
19N2ACC3	ALLIED CHEMISTRY- II (Theory behind chemical bonding, and organic qualitative analysis, kinetics of chemical reactions and catalysis)	1. Apply the rules for naming the coordination complexes and to illustrate the applications of metal complexes in biological systems. 2. To analyze the various organic compounds qualitatively 3. To understand the procedure involved in detection of elements. 4. To explain the kinetics of a chemical reaction and to calculate the order of a particular reaction 5. To evaluate the types of catalysis and theories of

		catalysis
19Z2ACC4	ALLIED CHEMISTRY PRACTICALS-II	1. Gain the knowledge of appearance, colour, physical state and odour of organic substances. 2. Distinguish whether the given compound is Aliphatic or Aromatic, and Saturated or Unsaturated. 3. Perform the confirmatory test for various functional groups present in the given organic compound. 4. Recognize the usage of apparatus and laboratory reagents. 5. Relate the experimental observations with theory behind practicals.
19N2ACC4	ALLIED CHEMISTRY	1. Gain the knowledge of appearance, colour, physical state and odour of organic

	PRACTICALS-II	substances. 2. Distinguish whether the given compound is Aliphatic or Aromatic and Saturated or Unsaturated. 3. Perform the confirmatory test for various functional groups present in the given organic compound. 4. Recognize the usage of apparatus and laboratory reagents. 5. Relate the experimental observations with theory behind practicals.
19C2NME	PROFITABLE HOME INDUSTRIES	1. Recognize the important nutrients present in food 2. Gain knowledge about the fundamental chemistry involved in dairy products 3. Determine the manufacture and functions of

		various soaps and creams 4. Learn the ingredients required for the preparation of various types ofshampoos, skin powder, nail polish Demonstrate the preparation 5. of some home products like candle, detergent powder, soap oil, ink , phenoyl and computer sambirani.
19C3CC7	ORGANIC AND INORGANIC CHEMISTRY	1. To interpret the concept of aromaticity and the main properties of aromatic compounds. 2. To explore reactivity patterns of conjugated, aromatic molecules and to evaluate the kinetics and thermodyna mics controlled reactions. 3. Explain types of oxides and oxyacids, their structure and reactivity in halogens 4. Discuss the properties d block elements & triads of transition elements.

		5. Recognize the role of oxidizing agents, reducing agents, group reagents and complexing agents, and inferences with theory behind practicals.
19C3CC8	PHYSICAL CHEMISTRY-I (Gaseous state, Solutions, dilute solutions, radio activity & Nuclear transformations and nuclear chemistry)	1. Gain a basic knowledge about the kinetic theory of gases, gaseous laws, types of velocities and properties of gases 2. Distinguish between ideal and non-ideal solutions Derive the relationship between molar mass of a non- volatile solute and colligative properties 3. Calculate the mass defect, packing fraction and binding energy for any nuclei 4. Predict the growing rate, mechanism and age of plants using radioactive elements
19C3SB1	AGRICULTURAL CHEMISTRY	1. Define the term soil 2. Describe the various types of fertilizers and their

		uses 3. Realize the requirements of manures and fertilizers for better production of various types of crops 4. Examine the adverse effect of pesticides 5. 5. Calculate the amount of calcium and magnesium present in various types of soils
19P3ACC1	ALLIED CHEMISTRY-I (Theory behind chemical bonding, quantitative and qualitative analysis, kinetics of chemical reactions and thermo dynamics)	1. To comprehend the fundamental theories of Valence Bond, types of overlapping and VSEPR. 2. To categorize the reactions involved in volumetric analysis 3. To analyze the various organic compounds qualitatively 4. To recognize the theories of chemical kinetics. 5. To highlight the importance of

		6. Thermodynamic s and its related functions
19C3CC9	INORGANIC QUALITATIV E ANALYSIS	1. Gain the knowledge of appearance, colour, physical state, and odour of inorganic substances 2. Distinguish whether the given compound is interfering or non-interfering radicals. 3. Perform the confirmatory test for various acid and basic radicals present in the given inorganic compound. 4. Recognize the usage of apparatus and laboratory reagents. 5. Avoiding hazardous experiments by doing microlevel eco friendly experiments.
19P3ACC2	Allied chemistry practicals-I	1. Describe the principles and procedures of various titrimetric methods 2. Identify suitable indicators for a particular

		reaction 3. Know the various terms such as standard solution, normality, molality, molarity, equivalent weight and molecular weight. 4. Select the specific titric method to estimate the amount of analyte present in the given solution. 5. Apply the Expressions and equations to calculate the strength of solutions.
19C4CC10	INORGANIC CHEMISTRY- III (Coordination Chemistry)	1. Know the structure and bonding of important coordination compounds 2. Apply the rules to calculate the magnetic properties of complexes and how magnetic moments can be employed for the interpretation of their structure 3. Get an overview about the reaction mechanism of metal complexes

		4. Import the skills to elucidate the structure and mode of bonding in 5. Organometallic compounds 6. 5. Gain knowledge about the chemistry of Lanthanides and Actinides
19C4CC11	PHYSICAL CHEMISTRY-II (Chemical Kinetics, Solid State and distribution Law)	1. To determine integrated rate expression for zero order, first order, second order reactions and their respective half- life period expressions with examples 2. To study the various factors which affect the rate of a chemical reaction such as concentration, temperature, and solvent 3. To learn the crystal diffraction and experimental techniques used to characterize the solid crystals To recognize and give the lattice parameter relationships for the seven crystal

		systems 4. To value the Nernst distribution law 5. - its thermodynamic derivation, modification of law when solute undergoes association, dissociation and chemical combination with one of the solvents
19C4SB2	NATURAL AND SYNTHETIC DYES	1. Know and comprehend the principle and theories of dyes 2. Identify the chromophoric groups and auxochromes present in the dyes 3. Classify the of dyes whether natural or synthetic Predict the structure of dyes 4. Recognise the applications of dyes in various industries
19C4CC12	ORGANIC QUALITATIVE	1. Gain the knowledge of appearance, colour,

	ANALYSIS	physical state, and odour of organic substances 2. Distinguish whether the given compound is Aliphatic or Aromatic and Saturated or Unsaturated. 3. Perform the confirmatory test for various functional groups present in the given organic compound. 4. Recognize the usage of apparatus and laboratory reagents. 5. Avoiding hazardous experiments by doing microlevel eco friendly experiments.
19P4ACC3	ALLIED CHEMISTRY-II (Periodic table and atomic properties, electro chemistry–I, II, Catalysis and photochemistry)	1. Understand the periodicity in periodic table 2. Understand the different types of condutances and their relations and the effect of dilution. 3. Use Nernst equation to calculate the electrode potential and emf of electrochemical cells. Study the applications of electrochemical measurements

		4. Understand the basics of photochemistry using laws of photochemistry and Jablonsky diagram 5. Derive the rate constants o certain photochemical reactions.
19P4ACC4	ALLIED CHEMISTRY PRACTICALS	1. Gain the knowledge of appearance, colour, physical state and odour of organic substances. 2. Distinguish whether the given compound is Aliphatic or Aromatic and Saturated or Unsaturated. 3. Perform the confirmatory test for various functional groups present in the given organic compound. 4. Recognize the usage of apparatus and laboratory reagents. 5. Relate the experimental observations with theory behind practicals.

C5CC11	ORGANIC CHEMISTRY – III	1. To analyze the synthetic importance of reactive methylene compounds 2. To generalize the characteristic features of optical isomers and geometrical isomers
C5CC12	PHYSICAL CHEMISTRY - III	3. To predict the feasibility of chemical reactions applying II law of thermodynamics 4. To explain the absolute entropy of substances and to calculate it
C5CC13	INORGANIC PRACTICALS	1. Acquire the knowledge of concept of gravimetric estimations. 2. Recognise the role of reagents in chemistry.
C5CC14	ORGANIC PREPARATION AND ESTIMATION	1. Recognize the usage of apparatus and laboratory reagents. 2. Relate the experimental observations with theory behind practicals.

C5ME1	SPECTRO SCOPY	1. To identify various functional groups present in organic molecules using IR frequency. 2. To predict the number and nature of protons/ carbons in organic molecules in 3. 1H-NMR/ 13C- NMR 4. spectroscopy
C5ME2	BIO CHEMISTRY	1. To identify the various metabolic reactions 2. To understand the importance of nucleic acids
C5SB3	MEDICINAL CHEMISTRY	3. To study the mechanism of drug action 4. To determine the designing and binding of drugs with receptors
C5SB4	NANO CHEMISTRY	1. Learn about the background on Nanoscience . 2. Understand the synthesis of nanomaterials and their application and the impact of nanomaterials

		on environment
C6CC15	ORGANIC CHEMISTRY-IV	1. To explicate the structures of Citral, Dipentene and Camphor. 2. To distinguish the properties of quinolin and isoquinoline
C6CC16	PHYSICAL CHEMISTRY-IV	1. Calculate the cell potential for a nonstandard cell. 2. Know the chemical reactions used in a lead-acid battery
C6ME3	ADVANCED ORGANIC CHEMISTRY	1. To sketch Frontier molecular orbitals in photochemistry. 2. To differentitate the molecular rearrangement s and to solve the simple problems
C6ME4	POLYMER CHE	1. 1. To understand the theories and mechanism of different types of polymerisation processes. 2. 2. To study the applications of the above

		techniques to synthesize different natural and synthetic polymers.
C6ME5	ADVANCED PHYSICAL CHEMISTRY	1. To understand the theories behind the spectral techniques like MW.IR,NMR and ESR 2. To study the applications of the above techniques to elucidate the structures of molecules
C6ME6	ADVANCED INORGANIC CHEMISTRY	1. To understand the theories behind inorganic photochemistry and 2. Electroanalytic al techniques. 3. 2. To study the applications of the above techniques to elucidate the structures of Bio-inorganic molecules
C6SB5	COMPUTERS IN CHEMISTRY	1. To write programs to determine lattice energy, half-life, normality, molarity, molality 2. To present structure based drug designing in

		both 2D and 3D
C6SB6	GREEN CHEMISTRY	1. To differentiate between yield and atom economy 2. To interpret the concept of Stereo selectivity, Chemo selectivity and 3. Regio selectivity
C6CC17	PHYSICAL CHEMISTRY PRACTICALS	1. Experience in some scientific methods employed in basic and applied physical chemistry 2. Developed skills in procedures and instrumental methods applied in analytical and practical tasks of physical chemistry
C6CC18	GREEN CHEMISTRY PRACTICALS	1. To understand green synthetic methods 2. To familiarise the synthesis of silver nanoparticle by green approach