FATIMA COLLEGE (AUTONOMOUS), MADURAI – 625018

NAME OF THE PROGRAMME: M.SC. CHEMISTRY **PROGRAMME CODE: PSCH**

PROGRAMME OUTCOMES:

Students will be able to

PO1: Apply acquired scientific knowledge to solve major and complex issues in the society/industry.

PO2: Attain research skills to solve complex cultural, societal and environmental issues.

PO3: Employ latest and updated tools and technologies to solve complex issues.

PO4: Demonstrate Professional Ethics that foster Community, Nation and Environment Building Initiatives.

PROGRAMME SPECIFIC OUTCOMES:

PSO1: Equipped with an in-depth knowledge of varied fields namely Organic Chemistry, Inorganic Chemistry, Physical and nano chemistry.

PSO1: Training in problem solving procedures enables to interpret the experimental data into structures and mechanisms.

PSO2: Provides a tremendous exposure and cultivates analytical and synthesising measures necessary to take up project work in reputed institutions.

PSO3: Programme renders diversified thinking thereby promotes creative skills.

PSO4: Directed to solve the problems that cause a negative impact on surroundings to pursue salient steps to safeguard environment,.

PSO5: Application-oriented input sharpens the skill to undertake CSIR-NET exam.

PSO6: Knowledge with practical dimensions becomes a driving power to undertake research in different areas at a global level.

PSO7: Multi-layered input enables to avail opportunities at chemical, pharmaceutical industries.

PSO8: Becomes a contributing force and development agent in society.

2019-2020

COURSE CODE	COURSE TITLE	NAME OF THE COURSE (LOCAL/ NATIONAL/ REGIONAL/ GLOBAL)	COURSE DESCRIPTION	COURSE OUTCOMES
19PG1C1	Inorganic Chemistry-I	Regional	This course deals with the theories of bonding with the knowledge of the periodic properties of elements and the various processes involved in nuclear Chemistry, reactors and the usefulness of radio isotopes.	CO1: To analyse all chemical species involved in organic and Inorganic reactions and to identify those as acid and bases CO2: To classify the bonds as ionic and covalent and to compare the theories CO3: To categorize the solid systems, to calculate the lattice energy and draw conclusions on their stability CO4: To predict the structures and magnetic properties of Inorganic compounds

				CO5: To gain in-depth knowledge of nuclear reactions, reactors and the applications of radio isotopes in all fields
19PG1C2	Organic Chemistry-I	Regional	This paper focuses on all the important aspects of organic chemistry like aromaticity, reaction intermediates, chirality and hetero cyclic.	CO1: To interpret the concept of aromaticity and the main properties of aromatic compounds. CO2: To explore reactivity patterns of conjugated ,aromatic molecules and to evaluate the kinetics and thermodynamics controlled reactions. CO3: To define the fundamentals of hilarity, prochirality, symmetry elements and applications of atropisomers. CO4: To comprehend of nucleophiles, electrophiles, electronegativity, and resonance

				CO5:.To sketch the preparation and properties of heterocyclic compounds.
19PG1C3	Physical Chemistry-I	Regional	This course gives detailed account of all the important concepts of electrochemistry and statistical thermodynamics.	CO1: To gain knowledge Kohlrausch's law and electrolytic conductance CO2: Calculate the molar conductance , degree of dissociation and electrical potential Possess thorough understanding of Debye- Huckel equation CO3:To gain knowledge of Electro catalysis and Electro synthesis CO4: Describe in detail about the three laws of thermodynamics CO5: Restate in their own words about the concept of distribution, thermodynamic probability and most probable distribution

				CO6: Correlate and explain the partial molar properties, chemical potential CO7: Categorize and compare various partition functions - translational, rotational , vibrational and electronic partition functions CO8: Distinguish various Fermi-Dirac and Bose-Einstein statistics and Maxwell-Boltzmann statistics based on the nature of the particles.
19PG1C4	Inorganic Practicals-I	Global	This paper gives hands on experience of Qualitatively analysing the inorganic salts containing simple and rare earth metal cations.	CO1: To study the principle of distribution of common and rare metal ions in different groups. CO2: To know the inter- and intra group precipitation and separation of metal ions. CO3: To improve the skill in the qualitative

				analysis of rare metal ions in different groups. CO4: To identify the methodology to analyse a metal ion in the presence of another metal ion.
19PG1C5	Organic Practicals-I	Global	This course gives hands on experience of qualitatively analyzing organic compounds and to synthesis simple organic compounds.	CO1: To be skilled in the separation of binary organic mixtures CO2: To gain knowledge on the skills of doing micro level analysis CO3: To know the methods of qualitative analysis of organic compounds CO4: To learn about the preparation of suitable derivative of the organic functional groups CO5: To prepare organic compounds.
19C1EDC	Essentials Of	Global	This paper is an inter disciplinary optional	CO1:To acquire knowledge of common

	Life		paper gives an account of preparation of house hold items, various analytical techniques such as, volumetric methods, and chromatographic methods	medicine. CO2: To express the concentration of solution in volumetric analysis. CO3: To differentiate column and TLC technique. CO4: To classify the different types of polymer s and its characteristics. CO5: To analyze the different types of soil and differentiate natural fertilizer from artificial fertilizer.
19PG2C6	Inorganic Chemistry-Ii	Global	This paper enables the students to understand the chemistry of complexes and their characterization and reaction mechanisms.	CO1: Compare the stabilities of complexes using stability constants and to identify the types of isomers CO2: To describe the theories of co-ordination compounds to understand the colours and magnetic properties and their position in the spectra

				chemical series CO3: Investigate the structures of complexes using IR,NMR ,E SR and other spectral techniques CO4: To .Possess a thorough understanding of electronic spectra of complexes CO5: To arrive at the mechanisms of substitution reactions in six and four coordinated complexes using kinetic studies
19PG2C7	Organic Chemistry-II		This course enables the students to get a thorough knowledge of elimination and addition reactions, conformational analysis and selective organic name reactions and	CO1: To comprehend the mechanism of elimination and substitution reactions and to apply the stereochemistry in E1, E2, ionic and pyrolytic eliminations. CO2: To interpret the concept of nucleophilic and free radical addition

			rearrangements, study of organic spectroscopy and their applications in structural elucidation of organic compounds.	reactions and metal hydride reduction and to discriminate the reactivity of organometallic reagents. CO3: To explore reactivity patterns of substituted cyclohexanes and to employ conformational reactivity in cis and trans decalins and to apply conformations in SN1, SN2, ionic, pyrolytic eliminations and NGP reactions. CO4: To acquire a complete knowledge of the principles of UV, IR spectroscopy and to examine the various functional groups present in organic molecules using λmax and IR frequency values . CO5: To differentiate the molecular rearrangements and to solve the

				simple problems and to recall the various naming reactions and to interpret the products.
19PG2C8	Physical Chemistry-II	Regional	This paper provides an extensive study of the topics such as Chemical kinetics and Quantum mechanics.	CO1: To acquire knowledge about the basic concepts of chemical kinetics CO2: To identify and analyze the effect of physical parameters μ, □, D on rate of reaction CO3: To derive rate constant for reactions using Lindeman, Hinshelwood, RRK, RRKM Theories CO4: To develop a knowledge and understanding of the concept Normalisation and orthogonalisation and to solve Schrodinger wave equation for particle in a one dimensional box, three dimensional

				box and Rigid rotator. CO5: To apply variation and perturbation method to He atom CO6: To calculate Delocalisation energy and π- bond order of conjugated molecules like cyclobutadiene, cyclopropenyl system and 1,3 butadiene.
19PG2C9	Inorganic Practicals-II	Global	This course gives training to prepare inorganic complexes in a pure form and to estimate metal ions present in the solution.	CO1: To enable the students to acquire the quantitative skills in volumetric analysis and gravimetric analysis CO2: To improve the skill in quantitative estimation of metal ions by various titric methods CO3: To identify the methodology to estimate a metal ion in the presence of another metal ion.

				CO4: To be skilled in synthesis of inorganic complexes.
19PG2C10	Organic Practicals-II	Global	This course gives hands on experience of quantitatively analyzing organic compounds and to synthesis organic compounds using two stages.	CO1: To develop the ability for synthesizing organic compounds by single stage. CO2: To develop the ability for synthesizing Organic compounds by double stage. CO3: To study the reaction mechanism.
19C2EDC	Essentials Of Life	Global	This paper is an inter disciplinary optional paper gives an account of preparation of house hold items, various analytical techniques such as, volumetric methods, and chromatographic	CO1: To acquire knowledge of common medicine. CO2: To express the concentration of solution in volumetric analysis. CO3: To differentiate column and TLC technique. CO4: To classify the different types of polymer s and its characteristics.

			methods	CO5:To analyze the different types of soil and differentiate natural fertilizer from artificial fertilizer.
COURSE CODE	**COURSE TITLE**	**NATURE OF THE COURSE (LOCAL/NATIONAL/REGIONAL/ GLOBAL)**	**COURSE DESCRIPTION**	**COURSE OBJECTIVES**
PG3C11	Organic Chemistry-III	Global	This paper provides an elaborate study of organic spectroscopy and their applications in structural elucidation of organic compounds. This paper also deals with reactions that are taking place under photochemical conditions and peri	• To acquire a complete knowledge of the working principles of 1H-NMR, 13C-NMR and Mass spectroscopy. • To develop an understanding of the significance of the number, positions, intensities and splitting of signals in nuclear magnetic resonance spectra.

			cyclic reactions and terpenoids.	
PG3C12	Physical Chemistry-III	Regional	This course covers the detailed study of group theory and its application and also covers the principles of surface chemistry, and a brief study of macromolecules.	• To differentiate the types of elements and symmetry operations. • To recognize the reducible & irreducible Representation.
PG3CE1	Material Chemistry	Global	This course deals with study of synthesis, properties, structure and applications of nano particles.	• To gain knowledge about the basic principles of nano chemistry and classification of nano materials. • To describe several synthesis of inorganic nano particles, one-dimensional nanostructures (nano tubes, nano rods, nano wires), thin films, nano porous materials, and nano

				structured bulk materials.
PG3CE2	Bio-Organic Chemistry	Global	This paper deals with the molecular drug designing, classification of proteins, enzymes	• To tabulate the functions and uses of enzymes • To design of drugs using molecular modelling
PG4C13	Inorganic Chemistry-III	Regional	This course covers the structure and Bonding of organ metallic compounds and basic concepts of bioinorganic compounds	• To calculate the SEP and identification of structure of boranes and carboranes • To describe the basic concepts of bio-inorganic compounds
PG4C14	Organic Chemistry-IV	Regional	This course paper deals with types of synthetic compounds, basic concepts of photochemistry, nucleic acids and steroids	• To know the Retro synthesis of achiral open chain molecules and cyclic target molecules, • To identify the suitable reagents in synthesis of organic compounds

PG4C15	Physical Chemistry-IV	Regional	This paper deals with many spectroscopic techniques like Microwave, IR, Raman and Photoelectron, ESR, NQR and Mossbauer.	• To calculate the bond lengths of diatomics from the value of their rotational constant. • To Outline the selection rules for rotational and vibrational spectra and rationalize the role of the molecular dipole moment in the selection rules.
PG4CE3	Analytical Chemistry	Global	This course deals with chromatographic techniques, spectroscopic methods, applications of C-programmes in chemistry	• To educate to calculate error analysis for various tests • To identify the applications of C-programming in chemistry
PG4CE4	Chemical Engineering	Global	This paper deals with analytical methods. It also deals with programming in C	• To demonstrate an understanding of computer programming language concepts • To explain the aim of water treatment,

			language and its applications to solve problems in chemistry	and discuss the required characteristics should the drinking water have.
PG4C16	Physical Practicals	Global	This lab course is course gives lab experience on physical experiments	• To demonstrate conduct metric Titration of Strong acid with a Strong Base. • To determine CST for the partial miscible solutions
PG4C17	Project	Global	This paper is designed to increase the skill of students in problem solving, critical thinking and analytical reasoning as applied to scientific problems	• To carry out scientific experiments • To accurately record and analyze the results of such experiments.

2018-2019

COURSE CODE	COURSE TITLE	NAME OF THE COURSE (LOCAL/ NATIONAL/ REGIONAL/ GLOBAL)	COURSE DESCRIPTION	COURSE OBJECTIVES
PG1C1	Inorganic Chemistry-I	Regional	This course deals with the theories of bonding with the knowledge of the periodic properties of elements and the various processes involved in nuclear Chemistry, reactors and the usefulness of radio isotopes.	• To analyse all chemical species involved in organic and Inorganic reactions and to identify those as acid and bases • To classify the bonds as ionic and covalent and to compare the theories
PG1C2	Organic Chemistry-I	Regional	This paper focuses on all the important	• To interpret the concept of aromaticity and the main properties of aromatic

			aspects of organic chemistry like aromaticity, reaction intermediates, chirality and heterocyclics.	compounds. • To explore reactivity patterns of conjugated, aromatic molecules and to evaluate the kinetics and thermodynamics controlled reactions.
PG1C3	Physical Chemistry-I	Regional	This course gives detailed account of all the important concepts of electrochemistry and statistical thermodynamics.	• To gain knowledge Kohlrausch's law and electrolytic conductance • Calculate the molar conductance , degree of dissociation and electrical potential
PG1C4	Inorganic Practicals-I	Global	This paper gives hands on experience of Qualitatively analysing the inorganic salts containing simple and rare earth metal cations.	• To study the principle of distribution of common and rare metal ions in different groups. • To know the inter- and intra group precipitation and separation of metal ions.

PG1C5	Organic Practicals-I	Global	This course gives hands on experience of qualitatively analyzing organic compounds and to synthesis simple organic compounds.	• To be skilled in the separation of binary organic mixtures • To gain knowledge on the skills of doing micro level analysis
PGCEDC	Analytical Techniques	Global	This paper is an inter disciplinary optional paper gives an account of various analytical techniques such as optical methods, electro analytical methods, chromatographic methods and spectroscopic methods.	• To be skilled in the various types of chromatographic techniques • To attain knowledge on optical spectroscopy, EPR, Mass spectroscopy.

PG2C6	Inorganic Chemistry-II	Global	This paper enables the students to understand the chemistry of complexes and their characterization and reaction mechanisms.	• Compare the stabilities of complexes using stability constants and to identify the types of isomers • To describe the theories of co-ordination compounds to understand the colours and magnetic properties and their position in the spectro chemical series
PG2C7	Organic Chemistry-II	Global	This course enables the students to get a thorough knowledge of elimination and addition reactions, conformational analysis and selective organic name reactions and rearrangements, study of organic spectroscopy and their	• To comprehend the mechanism of elimination and substitution reactions and to apply the stereochemistry in E1, E2, ionic and pyrolytic eliminations. • To interpret the concept of nucleophilic and free radical addition reactions and metal hydride reduction and to discriminate the reactivity of organometalic reagents.

			applications in structural elucidation of organic compounds.	
PG2C8	Physical Chemistry-II	Regional	This paper provides an extensive study of the topics such as Chemical kinetics and Quantum mechanics.	• To acquire knowledge about the basic concepts of chemical kinetics • To identify and analyze the effect of physical parameters μ, □, D on rate of reaction
PG2C9	Inorganic Practicals-II	Global	This course gives training to prepare inorganic complexes in a pure form and to estimate metal ions present in the solution.	• To enable the students to acquire the quantitative skills in volumetric analysis and gravimetric analysis • To improve the skill in quantitative estimation of metal ions by various titric methods
PG2C10	Organic Practicals-II	Global	This course gives hands on experience of quantitatively	• Students understand the quantitative analysis • To develop the ability for synthesizing

			analyzing organic compounds and to synthesis organic compounds using two stages.	organic compounds by single stage.
PGCEDC	Analytical Techniques	Global	This paper is an inter disciplinary optional paper gives an account of various analytical techniques such as optical methods, electro analytical methods, chromatographic methods and spectroscopic methods.	• To be skilled in the various types of chromatographic techniques • To attain knowledge on optical spectroscopy, EPR, Mass spectroscopy
PG3C11	Organic Chemistry-III	Global	This paper provides an elaborate study of	• To acquire a complete knowledge of the working principles of 1H-NMR, 13C-NMR

			organic spectroscopy and their applications in structural elucidation of organic compounds. This paper also deals with reactions that are taking place under photochemical conditions and pericyclic reactions	and Mass spectroscopy. • To develop an understanding of the significance of the number, positions, intensities and splitting of signals in nuclear magnetic resonance spectra.
PG3C12	Physical Chemistry-III	Regional	This course covers the detailed study of group theory and its application and also covers the principles of surface chemistry, and a brief study of	• To differentiate the types of elements and symmetry operations. • To recognize the reducible & irreducible Representation.

			macromolecules.	
PG3CE1	Material Chemistry	Global	This course deals with study of synthesis, properties, structure and applications of nano particles.	• To gain knowledge about the basic principles of nanochemistry and classification of nonmaterial's. • To describe several synthesis of inorganic nanoparticles, one-dimensional nanostructures (nanotubes, nanorods, nanowires), thin films, nanoporous materials, and nanostructured bulk materials.
PG3CE2	Bio-Organic Chemistry	Global	This paper deals with the molecular drug designing, classification of proteins, enzymes	• To tabulate the functions and uses of enzymes • To design of drugs using molecular modelling
PG4C13	Inorganic Chemistry-III	Regional	This course covers the structure and Bonding	• To calculate the SEP and identification of structure of boranes and carboranes

			of organ metallic compounds and basic concepts of bioinorganic compounds	• To describe the basic concepts of bio-inorganic compounds
PG4C14	Organic Chemistry-IV	Regional	This paper deals with introduction to organic synthesis, preparation and synthetic applications of some organic reagents used for synthesis, structural elucidation of few alkaloids, terpenoids, steroids and nucleic acids	• To know the Retro synthesis of achiral open chain molecules and cyclic target molecules, • To identify the suitable reagents in synthesis of organic compounds
PG4C15	Physical Chemistry-IV	Regional	This paper deals with many spectroscopic	• To calculate the bond lengths of diatomics from the value of their

			techniques like Microwave, IR, Raman and Photoelectron, ESR, NQR and Mossbauer.	rotational constant. • To Outline the selection rules for rotational and vibrational spectra and rationalize the role of the molecular dipole moment in the selection rules.
PG4CE3	Analytical Chemistry	Global	This course deals with chromatographic techniques, spectroscopic methods, applications of C-programms in chemistry	• To educate to calculate error analysis for various tests • To identify the applications of C-programming in chemistry
PG4CE4	Chemical Engineering	Global	This paper deals with analytical methods. It also deals with programming in C language and its applications to solve	• To demonstrate an understanding of computer programming language concepts • To explain the aim of water treatment, and discuss the required characteristics should the drinking water have.

			problems in chemistry	
PG4C16	Physical Practicals	Global	This lab course is course gives lab experience on physical experiments	• To demonstrate conduct metric Titration of Strong acid with a Strong Base. • To determine CST for the partial miscible solutions
PG4C17	Project	Global	This paper is designed to increase the skill of students in problem solving, critical thinking and analytical reasoning as applied to scientific problems	• To carry out scientific experiments • To accurately record and analyze the results of such experiments.

2017-2018

COURSE CODE	COURSE TITLE	NAME OF THE COURSE (LOCAL/ NATIONAL/ REGIONAL/ GLOBAL)	COURSE DESCRIPTION	COURSE OBJECTIVES
PG1C1	Inorganic Chemistry-I	Regional	This course deals with the theories of bonding with the knowledge of the periodic properties of elements and the various processes involved in nuclear Chemistry, reactors and the usefulness of radio isotopes.	• To analyse all chemical species involved in organic and Inorganic reactions and to identify those as acid and bases • To classify the bonds as ionic and covalent and to compare the theories
PG1C2	Organic	Regional	This paper focuses	• To interpret the concept of aromaticity

	Chemistry-I		on all the important aspects of organic chemistry like aromaticity, reaction intermediates, chirality and heterocyclics.	and the main properties of aromatic compounds. • To explore reactivity patterns of conjugated, aromatic molecules and to evaluate the kinetics and thermodynamics controlled reactions.
PG1C3	Physical Chemistry-I	Regional	This course gives detailed account of all the important concepts of electrochemistry and statistical thermodynamics.	• To gain knowledge Kohlrausch's law and electrolytic conductance • Calculate the molar conductance , degree of dissociation and electrical potential
PG1C4	Inorganic Practicals-I	Global	This paper gives hands on experience of Qualitatively analysing the	• To study the principle of distribution of common and rare metal ions in different groups. • To know the inter- and intra group

			inorganic salts containing simple and rare earth metal cations.	precipitation and separation of metal ions.
PG1C5	Organic Practicals-I	Global	This course gives hands on experience of qualitatively analyzing organic compounds and to synthesis simple organic compounds.	• To be skilled in the separation of binary organic mixtures • To gain knowledge on the skills of doing micro level analysis
PGCEDC	Analytical Techniques	Global	This paper is an inter disciplinary optional paper gives an account of various analytical techniques such as optical methods,	• To be skilled in the various types of chromatographic techniques • To attain knowledge on optical spectroscopy, EPR, Mass spectroscopy.

			electro analytical methods, chromatographic methods and spectroscopic methods.	
PG2C6	Inorganic Chemistry-II	Global	This paper enables the students to understand the chemistry of complexes and their characterization and reaction mechanisms.	• Compare the stabilities of complexes using stability constants and to identify the types of isomers • To describe the theories of co-ordination compounds to understand the colours and magnetic properties and their position in the spectrochemical series
PG2C7	Organic Chemistry-II	Global	This course enables the students to get a thorough knowledge of elimination and	• To comprehend the mechanism of elimination and substitution reactions and to apply the stereochemistry in E1, E2, ionic and pyrolytic eliminations.

			addition reactions, conformational analysis and selective organic name reactions and rearrangements, study of organic spectroscopy and their applications in structural elucidation of organic compounds.	• To interpret the concept of nucleophilic and free radical addition reactions and metal hydride reduction and to discriminate the reactivity of organometalic reagents.
PG2C8	Physical Chemistry-II	Regional	This paper provides an extensive study of the topics such as Chemical kinetics and Quantum mechanics.	• To acquire knowledge about the basic concepts of chemical kinetics • To identify and analyze the effect of physical parameters μ, □, D on rate of reaction

PG2C9	Inorganic Practicals-II	Global	This course gives training to prepare inorganic complexes in a pure form and to estimate metal ions present in the solution.	• To enable the students to acquire the quantitative skills in volumetric analysis and gravimetric analysis • To improve the skill in quantitative estimation of metal ions by various titric methods
PG2C10	Organic Practicals-II	Global	his course gives hands on experience of quantitatively analyzing organic compounds and to synthesis organic compounds using two stages.	• Students understand the quantitative analysis • To develop the ability for synthesizing organic compounds by single stage.
PGCEDC	Analytical Techniques	Global	This paper is an interdisciplinary optional paper gives	• To be skilled in the various types of chromatographic techniques • To attain knowledge on optical

			an account of various analytical techniques such as optical methods, electro analytical methods, chromatographic methods and spectroscopic methods.	spectroscopy, EPR, Mass spectroscopy
PG3C11	Organic Chemistry-III	Global	This paper provides an elaborate study of organic spectroscopy and their applications in structural elucidation of organic compounds. This paper also	• To acquire a complete knowledge of the working principles of 1H-NMR, 13C-NMR and Mass spectroscopy. • To develop an understanding of the significance of the number, positions, intensities and splitting of signals in nuclear magnetic resonance spectra.

			deals with reactions that are taking place under photochemical conditions and pericyclic reactioter penoids.	
PG3C12	Physical Chemistry-III	Regional	This course covers the detailed study of group theory and its application and also covers the principles of surface chemistry, and a brief study of macromolecules.	• To differentiate the types of elements and symmetry operations. • To recognize the reducible & irreducible Representation.
PG3CE1	Material Chemistry	Global	This course deals with study of synthesis,	• To gain knowledge about the basic principles of nanochemistry and classification of nonmaterial's.

			properties, structure and applications of nano particles.	• To describe several syntheses of inorganic nanoparticles, one-dimensional nanostructures (nanotubes, nanorods, nanowires), thin films, nanoporous materials, and nanostructured bulk materials.
PG3CE2	Bio-Organic Chemistry	Global	This paper deals with the molecular drug designing, classification of proteins, enzymes	• To tabulate the functions and uses of enzymes • To design of drugs using molecular modelling
PG4C13	Inorganic Chemistry-III	Regional	This course covers the structure and Bonding of organ metallic compounds and basic concepts of bioinorganic compounds	• To calculate the SEP and identification of structure of boranes and carboranes • To describe the basic concepts of bio-inorganic compounds

PG4C14	Organic Chemistry-IV	Regional	This paper deals with introduction to organic synthesis, preparation and synthetic applications of some organic reagents used for synthesis, structural elucidation of few alkaloids, terpenoids, steroids and nucleic acids	• To know the Retrosynthesis of achiral open chain molecules and cyclic target molecules, • To identify the suitable reagents in synthesis of organic compounds
PG4C15	Physical Chemistry-IV	Regional	This paper deals with many spectroscopic techniques like Microwave, IR,	• To calculate the bond lengths of diatomics from the value of their rotational constant. • To Outline the selection rules for rotational and vibrational spectra and

			Raman and Photoelectron, ESR, NQR and Mossbauer.	rationalize the role of the molecular dipole moment in the selection rules.
PG4CE3	Analytical Chemistry	Global	This course deals with chromatographic techniques, spectroscopic methods, applications of C-programmes in chemistry	• To educate to calculate error analysis for various tests • To identify the applications of C-programming in chemistry
PG4CE4	Chemical Engineering	Global	This paper deals with analytical methods. It also deals with programming in C	• To demonstrate an understanding of computer programming language concepts • To explain the aim of water treatment, and discuss the required characteristics

			language and its applications to solve problems in chemistry	the drinking water has.
PG4C16	Physical Practicals	Global	This lab course is course gives lab experience on physical experiments	• To demonstrate conduct metric Titration of Strong acid with a Strong Base. • To determine CST for the partial miscible solutions
PG4C17	Project	Global	This paper is designed to increase the skill of students in problem solving, critical thinking and analytical reasoning as applied to scientific problems	• To carry out scientific experiments • To accurately record and analyze the results of such experiments.

2016-2017

COURSE CODE	COURSE TITLE	NAME OF THE COURSE (LOCAL/ NATIONAL/ REGIONAL/ GLOBAL)	COURSE DESCRIPTION	COURSE OBJECTIVES
PG1C1	Inorganic Chemistry-I	Regional	This course deals with the theories of bonding with the knowledge of the periodic properties of elements and the various processes involved in nuclear Chemistry, reactors and the usefulness of radio isotopes.	• To analyse all chemical species involved in organic and Inorganic reactions and to identify those as acid and bases • To classify the bonds as ionic and covalent and to compare the theories
PG1C2	Organic Chemistry-I	Regional	This paper focuses on all the important	• To interpret the concept of aromaticity and the main properties

			aspects of organic chemistry like aromaticity, reaction intermediates, chirality and heterocyclics.	of aromatic compounds. • To explore reactivity patterns of conjugated, aromatic molecules and to evaluate the kinetics and thermodynamics controlled reactions.
PG1C3	Physical Chemistry-I	Regional	This course gives detailed account of all the important concepts of electrochemistry and statistical thermodynamics.	• To gain knowledge Kohlrausch's law and electrolytic conductance • Calculate the molar conductance , degree of dissociation and electrical potential
PG1C4	Inorganic Practicals-I	Global	This paper gives hands on experience of Qualitatively analysing the inorganic salts containing simple and rare earth metal cations.	• To study the principle of distribution of common and rare metal ions in different groups. • To know the inter- and intra group precipitation and separation of metal ions.

PG1C5	Organic Practicals-I	Global	This course gives hands on experience of qualitatively analyzing organic compounds and to synthesis simple organic compounds.	• To be skilled in the separation of binary organic mixtures • To gain knowledge on the skills of doing micro level analysis
PGCEDC	Analytical Techniques	Global	This paper is an inter disciplinary optional paper gives an account of various analytical techniques such as optical methods, electro analytical methods, chromatographic methods and spectroscopic methods.	• To be skilled in the various types of chromatographic techniques • To attain knowledge on optical spectroscopy, EPR, Mass spectroscopy.
PG2C6	Inorganic	Global	This paper enables the students to understand	• Compare the stabilities of complexes using stability constants and to

	Chemistry-II		the chemistry of complexes and their characterization and reaction mechanisms.	identify the types of isomers • To describe the theories of co-ordination compounds to understand the colours and magnetic properties and their position in the spectrochemical series
PG2C7	Organic Chemistry-II	Global	This course enables the students to get a thorough knowledge of elimination and addition reactions, conformational analysis and selective organic name reactions and rearrangements, study of organic spectroscopy and their applications in structural elucidation of	• To comprehend the mechanism of elimination and substitution reactions and to apply the stereochemistry in E1, E2, ionic and pyrolytic eliminations. • To interpret the concept of nucleophilic and free radical addition reactions and metal hydride reduction and to discriminate the reactivity of organometalic reagents.

			organic compounds.	
PG2C8	Physical Chemistry-II	Regional	This paper provides an extensive study of the topics such as Chemical kinetics and Quantum mechanics.	• To acquire knowledge about the basic concepts of chemical kinetics • To identify and analyze the effect of physical parameters μ, □, D on rate of reaction
PG2C9	Inorganic Practicals-II	Global	This course gives training to prepare inorganic complexes in a pure form and to estimate metal ions present in the solution.	• To enable the students to acquire the quantitative skills in volumetric analysis and gravimetric analysis • To improve the skill in quantitative estimation of metal ions by various titric methods
PG2C10	Organic Practicals-II	Global	This course gives hands on experience of quantitatively analyzing organic compounds and to synthesis organic	• Students understand the quantitative analysis • To develop the ability for synthesizing organic compounds by single stage.

			compounds using two stages.	
PGCEDC	Analytical Techniques	Global	This paper is an inter disciplinary optional paper gives an account of various analytical techniques such as optical methods, electro analytical methods, chromatographic methods and spectroscopic methods.	• To be skilled in the various types of chromatographic techniques • To attain knowledge on optical spectroscopy, EPR, Mass spectroscopy
PG3C11	Organic Chemistry-III	Global	This paper provides an elaborate study of organic spectroscopy and their applications in structural elucidation of organic compounds.	• To acquire a complete knowledge of the working principles of 1H-NMR, 13C-NMR and Mass spectroscopy. • To develop an understanding of the significance of the number, positions, intensities and splitting of signals in

			This paper also deals with reactions that are taking place under photochemical conditions and pericyclicreactiofew alkaloids and terpenoids.	nuclear magnetic resonance spectra.
PG3C12	Physical Chemistry-III	Regional	This course covers the detailed study of group theory and its application and also covers the principles of surface chemistry, and a brief study of macromolecules.	• To differentiate the types of elements and symmetry operations. • To recognize the reducible &irreducible Representation.
PG3CE1	Material Chemistry	Global	This course deals with study of synthesis,	• To gain knowledge about the basic principles of nanochemistry and

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PG3CE2	Bio-Organic Chemistry	Global	This paper deals with the molecular drug designing, classification of proteins, enzymes	• To tabulate the functions and uses of enzymes • To design of drugs using molecular modelling
PG4C13	Inorganic Chemistry-III	Regional	This course covers the structure and Bonding of organ metallic compounds and basic concepts of bioinorganic compounds	• To calculate the SEP and identification of structure of boranes and carboranes • To describe the basic concepts of bio-inorganic compounds

PG4C14	Organic Chemistry-IV	Regional	This paper deals with introduction to organic synthesis, preparation and synthetic applications of some organic reagents used for synthesis, structural elucidation of few alkaloids, terpenoids, steroids and nucleic acids	• To know the Retrosynthesis of achiral open chain molecules and cyclic target molecules, • To identify the suitable reagents in synthesis of organic compounds
PG4C15	Physical Chemistry-IV	Regional	This paper deals with many spectroscopic techniques like Microwave, IR, Raman and Photoelectron, ESR, NQR and Mossbauer.	• To Calculate the bond lengths of diatomics from the value of their rotational constant. • To Outline the selection rules for rotational and vibrational spectra and rationalize the role of the molecular dipole moment in the selection rules.

PG4CE3	Analytical Chemistry	Global	This course deals with chromatographic techniques, spectroscopic methods, applications of C-programms in chemistry	• To educate to calculate error analysis for various tests • To identify the applications of C-programming in chemistry
PG4CE4	Chemical Engineering	Global	This paper deals with analytical methods. It also deals with programming in C language and its applications to solve problems in chemistry	• To demonstrate an understanding of computer programming language concepts • To explain the aim of water treatment, and discuss the required characteristics should the drinking water have.
PG4C16	Physical Practicals	Global	This lab course is course gives lab experience on physical experiments	• To demonstrate conduct to metric Titration of Strong acid with a Strong Base. • To determine CST for the partial

				miscible solutions
PG4C17	Project	Global	This paper is designed to increase the skill of students in problem solving, critical thinking and analytical reasoning as applied to scientific problems	• To carry out scientific experiments • To accurately record and analyze the results of such experiments.

2015-2016

COURSE CODE	COURSE TITLE	NAME OF THE COURSE (LOCAL/NATIONAL/REGIONAL/GLOBAL)	COURSE DESCRIPTION	COURSE OBJECTIVES
PG1C1	Inorganic	Regional	This course deals with the theories of bonding	• To analyse all chemical species involved in organic and Inorganic

	Chemistry-I		with the knowledge of the periodic properties of elements and the various processes involved in nuclear Chemistry, reactors and the usefulness of radio isotopes.	reactions and to identify those as acid and bases • To classify the bonds as ionic and covalent and to compare the theories
PG1C2	Organic Chemistry-I	Regional	This paper focuses on all the important aspects of organic chemistry like aromaticity, reaction intermediates, chirality and heterocyclics.	• To interpret the concept of aromaticity and the main properties of aromatic compounds. • To explore reactivity patterns of conjugated ,aromatic molecules and to evaluate the kinetics and thermodynamics controlled reactions.
PG1C3	Physical Chemistry-I	Regional	This course gives detailed account of all	• To gain knowledge Kohlrausch's law and electrolytic conductance

			the important concepts of electrochemistry and statistical thermodynamics.	• Calculate the molar conductance , degree of dissociation and electrical potential
PG1C4	Inorganic Practicals-I	Global	This paper gives hands on experience of Qualitatively analysing the inorganic salts containing simple and rare earth metal cations.	• To study the principle of distribution of common and rare metal ions in diffferent groups. • To know the inter- and intra group precipitation and separation of metal ions.
PG1C5	Organic Practicals-I	Global	This course gives hands on experience of qualitatively analyzing organic compounds and to synthesis simple organic compounds.	• To be skilled in the separation of binary organic mixtures • To gain knowledge on the skills of doing micro level analysis
PGCEDC	Analytical	Global	This paper is an inter	• To be skilled in the various types of

	Techniques		disciplinary optional paper gives an account of various analytical techniques such as optical methods, electro analytical methods, chromatographic methods and spectroscopic methods.	chromatographic techniques • To attain knowledge on optical spectroscopy, EPR, Mass spectroscopy.
PG2C6	Inorganic Chemistry-II	Global	This paper enables the students to understand the chemistry of complexes and their characterization and reaction mechanisms.	• Compare the stabilities of complexes using stability constants and to identify the types of isomers • To describe the theories of co-ordination compounds to understand the colours and magnetic properties and their position in the spectrochemical series

PG2C7	Organic Chemistry-II	Global	This course enables the students to get a thorough knowledge of elimination and addition reactions, conformational analysis and selective organic name reactions and rearrangements, study of organic spectroscopy and their applications in structural elucidation of organic compounds.	• CO1- To comprehend the mechanism of elimination and substitution reactions and to apply the stereochemistry in E1, E2, ionic and pyrolytic eliminations. • CO2- To interpret the concept of nucleophilic and free radical addition reactions and metal hydride reduction and to discriminate the reactivity of organometalic reagents.
PG2C8	Physical Chemistry-II	Regional	This paper provides an extensive study of the topics such as Chemical kinetics and Quantum mechanics.	• To acquire knowledge about the basic concepts of chemical kinetics • To identify and analyze the effect of physical parameters μ, □, D on rate of reaction

PG2C9	Inorganic Practicals-II	Global	This course gives training to prepare inorganic complexes in a pure form and to estimate metal ions present in the solution.	• To enable the students to acquire the quantitative skills in volumetric analysis and gravimetric analysis • To improve the skill in quantitative estimation of metal ions by various titric methods
PG2C10	Organic Practicals-II	Global	This course gives hands on experience of quantitatively analyzing organic compounds and to synthesis organic compounds using two stages.	• Students understand the quantitative analysis • To develop the ability for synthesizing organic compounds by single stage.
PGCEDC	Analytical Techniques	Global	This paper is an inter disciplinary optional paper gives an account of various analytical techniques such as	• To be skilled in the various types of chromatographic techniques • To attain knowledge on optical spectroscopy, EPR, Mass

			optical methods, electro analytical methods, chromatographic methods and spectroscopic methods.	spectroscopy
PG3C11	Organic Chemisty-III	Global	This paper provides an elaborate study of organic spectroscopy and their applications in structural elucidation of organic compounds. This paper also deals with reactions that are taking place under photochemical conditions and pericyclic reactions	• To acquire a complete knowledge of the working principles of 1H-NMR, 13C-NMR and Mass spectroscopy. • To develop an understanding of the significance of the number, positions, intensities and splitting of signals in nuclear magnetic resonance spectra.
PG3C12	Physical	Regional	This course covers the	• To differentiate the types of elements

	Chemistry-III		detailed study of group theory and its application and also covers the principles of surface chemistry, and a brief study of macromolecules.	and symmetry operations. • To recognize the reducible & irreducible Representation.
PG3CE1	Material Chemistry	Global	This course deals with study of synthesis, properties, structure and applications of nano particles.	• To gain knowledge about the basic principles of nanochemistry and classification of nanomaterials. • To describe several synthesis of inorganic nanoparticles, one-dimensional nanostructures (nanotubes, nanorods, nanowires), thin films, nanoporous materials, and nanostructured bulk materials.
PG3CE2	Bio-Organic Chemistry	Global	This paper deals with the molecular drug	• To tabulate the functions and uses of enzymes

			designing, classification of proteins, enzymes	• To design of drugs using molecular modelling
PG4C13	Inorganic Chemistry-III	Regional	This course covers the structure and Bonding of organ metallic compounds and basic concepts of bioinorganic compounds	• To calculate the SEP and identification of structure of boranes and carboranes • To describe the basic concepts of bio-inorganic compounds
PG4C14	Organic Chemistry-IV	Regional	This paper deals with introduction to organic synthesis, preparation and synthetic applications of some organic reagents used for synthesis, structural elucidation of few alkaloids, terpenoids,	• To know the Retrosynthesis of achiral open chain molecules and cyclic target molecules, • To identify the suitable reagents in synthesis of organic compounds

			steroids and nucleic acids	
PG4C15	Physical Chemistry-IV	Regional	This paper deals with many spectroscopic techniques like Microwave, IR, Raman and Photoelectron, ESR, NQR and Mossbauer.	• To calculate the bond lengths of diatomics from the value of their rotational constant. • To Outline the selection rules for rotational and vibrational spectra and rationalize the role of the molecular dipole moment in the selection rules.
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PG4CE4	Chemical	Global	This paper deals with	• To demonstrate an understanding of

	Engineering		analytical methods. It also deals with programming in C language and its applications to solve problems in chemistry	computer programming language concepts • To explain the aim of water treatment, and discuss the required characteristics should the drinking water have.
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PG4C17	Project	Global	This paper is designed to increase the skill of students in problem solving, critical thinking and analytical reasoning as applied to scientific problems	• To carry out scientific experiments • Toaccurately record and analyze the results of such experiments.