

BSc. CHEMISTRY

**PROGRAMME AND
COURSE OUTCOMES**

BSc. Chemistry

Programme Outcomes

PO1	Develop scientific outlook scientific attitude and scientific temper
PO2	Develop skill in experimenting , analyzing and interpreting data
PO3	Develop research attitude and adopt scientific method of identifying,
PO4	Analysing and solving research problems in an innovative way
PO5	Apply physical and mathematical theories and principles in the context of chemical science
PO6	Use chemistry related soft wares for drawing structure and plotting graphs
PO7	Use instruments- potentiometer, conductometer, pH meter and colorimeter
PO8	Acquire skill in safe handling of chemicals including hazardous materials.
PO9	Identify the ingredients in household chemicals, use them in a critical way
PO10	Predict analytical procedures, compare experimental, theoretical and graphical methods of analysis
PO11	Predict reaction mechanism in organic reactions
PO12	Understand the terms, concepts, methods, principles and experimental techniques of physical, organic, inorganic and analytical chemistry
PO13	Develop critical thinking and adopt healthier attitudes towards individual, community and culture through the course of Chemistry
PO14	Become cautious about environmental aspects and impact of chemicals in soil, water and air and adopt ecofriendly approach in all frontiers of life
PO15	Become responsible in consumption of natural resources and adopt measures for sustainable development
PO16	Visit Chemical factories and industries with scientific curiosity
PO17	Develop writing skills and presentation skills using audio visual aids
PO18	Compare and share knowledge in an interdisciplinary manner
PO19	Inculcate spirit of originality, novelty, and necessity in scientific research
PO20	Contribute to the academic and industrial requirements of the society
PO21	Get motivated to higher studies - PG Degree in different branches of Chemistry, B.Ed. Degree in Physical Science, and job opportunities in industrial and non-industrial sectors
PO22	Adopt safer life skills in a human friendly and ecofriendly way

Course Outcomes

Semester 1

COURSE TYPE	LANGUAGE COURSE I
COURSE NAME	LANGUAGE SKILLS
COURSE CODE	EN111.1
CREDIT	4
HOURS	5
COURSE OUTCOMES	
CO1	Master the language for personal and professional growth.
CO2	Acquire basic language skills through interactive classroom sessions.
CO3	Connect language with literature.

COURSE TYPE	ADDITIONAL LANGUAGE I
COURSE NAME	MALAYALAM POETRY
COURSE CODE	ML 1111.1
CREDIT	3
HOURS	4
COURSE OUTCOMES	
CO1	Gaining an awareness of the historical development of Malayalam poetry.
CO2	The poetic taste and interest in poetry is developed.
CO3	A finer understanding of poetic elements emerges.
CO4	Ability to critically analyse poems.
CO5	Comparatively defining writing poems.
CO6	Preparing a poetry review.

COURSE TYPE	LANGUAGE COURSE I
COURSE NAME	HINDI KAHANI SAHITYA
COURSE CODE	HN 1111.1
CREDIT	3
HOURS	4

COURSE OUTCOMES	
CO1	Recollect the main works of the representative story writers
CO2	Understand the craft of the different story writers
CO3	Analyze and evaluate the works of the story writers they studied
CO4	Understand how the resource language is used as a medium in creative writing

COURSE TYPE	LANGUAGE COURSE I
COURSE NAME	GRAMMAR, COMMUNICATION, POETRY, HISTORY OF SYRIAC LITERATURE
COURSE CODE	SR 1111.1
CREDIT	3
HOURS	4
COURSE OUTCOMES	
CO1	To communicate effectively
CO2	Understand the craft of constructing conversations
CO3	Articulation and expression of ideas
CO4	Understand and assimilate ideas in a text

COURSE TYPE	FOUNDATION COURSE I
COURSE NAME	WRITINGS ON CONTEMPORARY ISSUES
COURSE CODE	EN1121
CREDIT	2
HOURS	4
COURSE OUTCOMES	
CO1	Sensitize students to the major issues in the society and the world.
CO2	Introduce and provide varied perspectives on contemporary issues.
CO3	Encourage critical and analytical skill.

COURSE TYPE	CORE COURSE-I
COURSE NAME	INORGANIC CHEMISTRY I
COURSE CODE	CH 1141
CREDIT	4

HOURS	4
COURSE OUTCOME	
CO1	Discuss the course of development of structure of atom.
CO2	Apply rules for filling electrons in classifying elements into s, p, d and f blocks
CO3	Define various scales of electronegativities and their applications
CO4	Define Effective nuclear charge and Slater's rules
CO5	Discuss about diagonal relationship and anomalous behaviour of hydrogen and other first element in each group.
CO6	Correlate and predict general properties of s and p block elements based on their electronic configuration.
CO7	Realise applications of s and p block elements in sustainable and renewable energy sources.
CO8	Define various concepts of acids and bases.
CO9	Understand reactions in non-aqueous solvents.
CO10	Realise various causes, effects and control measures of environmental pollution.
CO11	Review national movements for environmental protection.

COURSE TYPE	COMPLEMENTARY COURSE I
COURSE NAME	DIFFERENTIAL CALCULUS AND SEQUENCES AND SERIES
COURSE CODE	MM 1131.2
CREDIT	3
HOURS	4
COURSE OUTCOMES	
CO1	Designed to get a fairly decent coverage of calculus of one or more variables
CO2	Develop the idea of indefinite integral
CO3	Demonstrate the functions of two or more independent variables
CO4	Develop new structures based on given structures

COURSE TYPE	COMPLEMENTARY COURSE II
COURSE NAME	ROTATIONAL DYNAMICS AND PROPERTIES OF MATTER
COURSE CODE	PY 1131.2
CREDIT	2
HOURS	4
COURSE OUTCOMES	
CO1	Recognize the Rotational dynamics of rigid bodies of different shapes and their applications
CO2	Understand the basics of simple harmonic motion and mechanical waves and their applications
CO3	Understand the concepts of moduli of elasticity and their applications
CO4	Explain the properties of fluids such as surface tension and viscosity and their applications with examples

Semester 2

COURSE TYPE	LANGUAGE COURSE III
COURSE NAME	ENVIRONMENTAL STUDIES AND DISASTER MANAGEMENT
COURSE CODE	EN1121.1
CREDIT	5
HOURS	5
COURSE OUTCOMES	
CO1	Engage with a wide range of issues in environmental studies and disaster management.
CO2	Acquire values for environmental protection and conservation.
CO3	Recognise the ecological basis for regional and global environmental issues
CO4	Manage natural disasters and other emergency situations
CO5	Develop a critical vocabulary related to environmental studies and disaster management.

COURSE TYPE	LANGUAGE COURSE IV
COURSE NAME	ENGLISH GRAMMAR USAGE AND WRITING
COURSE CODE	EN1212.1
CREDIT	4
HOURS	4
COURSE OUTCOMES	
CO1	Acquire good understanding of modern English grammar.
CO2	Write grammatically and idiomatically correct language.
CO3	Improve verbal communication skill.
CO4	Minimize mother tongue influence.

COURSE TYPE	LANGUAGE COURSE V
SEMESTER	II
COURSE NAME	LITERATURE OF PROSE
COURSE CODE	ML 1211.1
CREDIT	3
HOURS	4
COURSE OUTCOMES	
CO1	Enables general awareness of major literary forms in Malayalam prose.

CO2	Researching and analysing the evolution of prose forms.
CO3	The imaginative ability to analyse texts is developed.
CO4	Comparatively observes the writing style of the writers.
CO5	Critical studies are prepared by analysing the content, language, socio-political perspective and aesthetic level of the writings.

COURSE TYPE	LANGUAGE COURSE V
COURSE NAME	KATHETAR HIDI GADYA VIDHAAYEIN
COURSE CODE	HN 1211.1
CREDIT	3
HOURS	4
COURSE OUTCOMES	
CO1	Recollect the main works of the prescribed writers
CO2	Understand the forms of various prose writing in Hindi
CO3	Analyses & evaluate the prose forms prescribed, with respect to the craft and the relevance

COURSE TYPE	LANGUAGE COURSE V
COURSE NAME	GRAMMAR, COMMUNICATION, POETRY, HISTORY OF SYRIAC LITERATURE
COURSE CODE	SR 1211.1
CREDIT	3
HOURS	4
COURSE OUTCOMES	
CO1	To enrich vocabulary and conversational articulation
CO2	Understand the forms of various genres of writings in Syriac
CO3	Analyse and evaluate the of history of Syriac literature

COURSE TYPE	FOUNDATION COURSE II
COURSE NAME	CHEMISTRY –ITS ORIGIN, METHODOLOGY AND IMPACTS
COURSE CODE	CH 1221
CREDIT	2
HOURS	2

COURSE OUTCOMES	
CO1	Appreciate the development of scientific theories through years with specific examples
CO2	Develop curiosity and scientific attitude towards the application of chemistry in daily life
CO3	Outline a procedure for experimentation
CO4	Appraise the current development in Chemistry
CO5	Identify the common ingredients of house hold synthetic products
CO6	Discriminate and classify chemicals used as drugs, explosives,
CO7	Get motivated in visiting chemical Industries
CO8	Adopt safety measures in handling chemicals
CO9	Draw titration curves and explain theory of volumetric titrations
CO10	Select suitable indicators for acid base titration knowing the theories of acid base titration and indicators
CO11	Develop computational skills
CO12	Discuss separation techniques of filtration and chromatographic techniques

COURSE TYPE	FOUNDATION COURSE II
COURSE NAME	LAB COURSE
COURSE CODE	CH 1221
CREDIT	2
HOURS	2
COURSE OUTCOMES	
CO1	Get acquainted with Computer Lab based instruction on the use of computer and internet in learning.
CO2	Use of educational softwares, information mining from internet and using INFLIBNET/NICNET, NPTEL and VIRTUAL LABS OF MHRD

CO3	Learn Word processing and document preparation. Use of Spread sheets in Data handling and presentation
CO4	Develop skill in chemical structure drawing and visualization of molecules using chemistry softwares

COURSE TYPE	COMPLEMENTARY COURSE III
COURSE NAME	INTEGRAL CALCULUS AND VECTOR DIFFERENTIATION
COURSE CODE	MM 1231.2
CREDIT	3
HOURS	4
COURSE OUTCOMES	
CO1	Compare and contrast the ideas of continuity and differentiability
CO2	Able to evaluate integrals of different types
CO3	Will be able to evaluate area and volume using double and tripe integrals
CO4	Able to apply the concept of multivariable function to solve mathematical problems

COURSE TYPE	COMPLEMENTARY COURSE IV
COURSE NAME	THERMAL PHYSICS
COURSE CODE	PY 1231.2
CREDIT	2
HOURS	4
COURSE OUTCOMES	
CO1	Identify the process of diffusion
CO2	Distinguish the various process of heat transmission
CO3	Recognize the different thermodynamic processes
CO4	Recognize the difference of petrol and diesel engines
CO5	Obtain the concept of entropy and apply it to physical situations

Semester 3

COURSE TYPE	LANGUAGE COURSE VI
COURSE NAME	ENGLISH FOR CAREER
COURSE CODE	EN1311.1
CREDIT	4
HOURS	5
COURSE OUTCOMES	
CO1	Introduce students to the language skills required for appearing in career oriented competitive examinations.
CO2	Develop cognitive, logical, verbal and analytical skills necessary to succeed in competitive examinations.
CO3	Provide the pattern of questions based on common models of competitive tests.
CO4	Help students to prepare for and appear in competitive examinations.

COURSE TYPE	LANGUAGE COURSE VII
COURSE NAME	LANGUAGE AWARENESS AND CREATIVITY
COURSE CODE	ML 1311.1
CREDIT	4
HOURS	5
COURSE OUTCOMES	
CO1	Understanding the usage patterns of Malayalam language.
CO2	Acquiring the skill to use language correctly.
CO3	Gaining proficiency in elementary grammar lessons and self-assessment.
CO4	Gaining practical training in translation and conducting and evaluating translation essays.
CO5	Gaining insight into the creative lives of writers and observing them comparatively.
CO6	Creating new compositions.

COURSE TYPE	LANGUAGE COURSE VII
COURSE NAME	HINDI KAVITA SAAHITYA
COURSE CODE	HN 1311.1
CREDIT	4
HOURS	5

COURSE OUTCOMES	
CO1	Appreciates ancient and modern Hindi poems.
CO2	Critically evaluates the contribution of Ancient and modern poets to the development of Hindi poetry
CO3	Elucidates key lines of poetry with reference to context.

COURSE TYPE	LANGUAGE COURSE VII
COURSE NAME	GRAMMAR, COMMUNICATION, PROSE, HISTORY OF SYRIAC PEOPLE IN INDIA
COURSE CODE	SR 1311.1
CREDIT	3
HOURS	5
COURSE OUTCOMES	
CO1	To develop LSRW skills.
CO2	Critically evaluate the aesthetics of literature
CO3	Understands how past influences the present

COURSE TYPE	CORE COURSE II
COURSE NAME	INORGANIC CHEMISTRY II
COURSE CODE	CH 1341
CREDIT	3
HOURS	Theory-3 Practical-2
COURSE OUTCOMES	
CO1	Discuss various applications of intermolecular interactions
CO2	Understand chemistry of glass, silicates and silicones
CO3	Discuss chemistry of Boron compounds, oxyacids and oxides of Phosphorous
CO4	Understand refractory carbides, nitrides, borides and silicides.
CO5	Describe various types of halogen compounds.
CO6	Understand chemistry of noble gas
CO7	Understand inorganic polymers and their applications.
CO8	Distinguish between types of nuclear reactions.
CO9	Describe measurement of radioactivity.
CO10	Discuss applications of radioactivity in various fields.
CO11	Understand introductory concepts of nanochemistry

CO12	Suggest methods of synthesizing nano materials.
CO13	Appreciate the variety of applications of nanomaterials.
CO14	Discuss various applications of intermolecular interactions
CO15	Understand chemistry of glass, silicates and silicones

COURSE TYPE	COMPLEMENTARY COURSE V
COURSE NAME	LINEAR ALGEBRA, PROBABILITY THEORY AND NUMERICAL SOLUTIONS
COURSE CODE	MM 1331.2
CREDIT	4
HOURS	5
COURSE OUTCOMES	
CO1	Understand the concepts of vectorspace and linear transformation
CO2	Applied aspects of statistics
CO3	Apply methods to solve real world problems, analyze their accuracy

COURSE TYPE	COMPLEMENTARY COURSE VI
COURSE NAME	OPTICS MAGNETISM AND ELECTRICITY
COURSE CODE	PY 1331.2
CREDIT	2
HOURS	Theory-3 Practical-2
COURSE OUTCOMES	
CO1	Differentiate the optical phenomena – interference diffraction and Polarization
CO2	Explain the principle behind the experiments -Newton's rings, air wedge and diffraction grating
CO3	Identify the phenomenon of polarization
CO4	Understand the working and application of laser in the field of Fiber Optics
CO5	Distinguish different magnetic materials
CO6	Attain knowledge about the theory of magnetism

Semester 4

COURSE TYPE	LANGUAGE COURSE VIII
COURSE NAME	READINGS IN LITERATURE
COURSE CODE	EN 141.11
CREDIT	4
HOURS	5
COURSE OUTCOMES	
CO1	Familiarize with various genres of writing.
CO2	Able to effectively read and appreciate literature
CO3	Acquire critical thinking by reading between the lines

COURSE TYPE	LANGUAGE COURSE IX
COURSE NAME	LITERATURE OF VISUAL ARTS
COURSE CODE	ML 1411.1
CREDIT	4
HOURS	5
COURSE OUTCOMES	
CO1	Discovers and describes the richness and diversity of Kerala's visual arts.
CO2	Examining the evolution from composition to practice.
CO3	Kathakali, OttanTullal, Drama and Cinema art forms and the literary works based on them are evaluated together.
CO4	Critically enjoying the visual arts.
CO5	Writing Plays and Screen plays.
CO6	Leads the creative expression of arts such as acting, screen play writing, Play writing

COURSE TYPE	LANGUAGE COURSE IX
COURSE NAME	HINDI KAVITA SAAHITYA
COURSE CODE	HN 1411.1
CREDIT	4
HOURS	5
COURSE OUTCOMES	
CO1	Appreciate and evaluate one act plays with respect to craft and subject.
CO2	Understand the correct usages in Hindi and write grammatically correct sentences in Hindi.
CO3	Define parts of speech and identify the parts of speech in a given

	sentence.
CO4	Translate simple passages from English to Hindi.

COURSE TYPE	LANGUAGE COURSE IX
COURSE NAME	GRAMMAR, COMMUNICATION, PROSE, HISTORY OF SYRIAC PEOPLE IN INDIA
COURSE CODE	SR 1411.1
CREDIT	3
HOURS	5
COURSE OUTCOMES	
CO1	Enhance integral development through effective communication
CO2	Understand the correct usages in Syriac and write grammatically correct sentences.
CO3	Develop imagination by comprehending the aesthetics of literature.
CO4	To apply historical knowledge in solving present problems

COURSE TYPE	CORE COURSE III
COURSE NAME	ORGANIC CHEMISTRY – I
COURSE CODE	CH 1441
CREDIT	3
HOURS	3
COURSE OUTCOMES	
CO1	Recall the fundamentals of organic chemistry.
CO2	Apply the electron displacement effects to compare acidity, basicity and stability of organic compounds/intermediates.
CO3	Judge the reaction mechanism of substitution and elimination on the basis of the structure of alkyl halides.
CO4	Summarise the chemistry of reaction intermediates.
CO5	Discuss optical, geometrical and conformational isomerism of organic compounds.
CO6	Use CIP rules to predict the configuration of organic compounds
CO7	Differentiate photochemical and thermal reactions.
CO8	Discuss theory of colour and constitution and the method of synthesis of dyes
CO9	Explain aromaticity, orientation effect and mechanism of aromatic electrophilic substitution.

CO10	Demonstrate the method of determination of reaction mechanism
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COURSE TYPE	CORE COURSE IV- LAB COURSE 1
COURSE NAME	INORGANIC QUALITATIVE ANALYSIS
COURSE CODE	CH 1442
CREDIT	2
HOURS	2
COURSE OUTCOME	
CO1	Obey Lab safety instructions, develop qualities of punctuality, regularity and scientific attitude, out look and scientific temper (GOOD LAB PRACTICES)
CO2	Develop skill in safe handling of chemicals, take precaution against accidents and follow safety measures
CO3	Use glass wares, electric oven, burners and weighing balance
CO4	Develop skill in observation, prediction and interpretation of reactions
CO5	Detect solubility, and classify compounds according to their solubility
CO6	Apply the principle of common ion effect and solubility product in the identification and separation of ions
CO7	Develop skill in preparing and purifying inorganic complex compounds
CO8	Use filtration and chromatographic techniques, vacuum pump and centrifugal pumps

COURSE TYPE	COMPLEMENTARY COURSE VII
COURSE NAME	DIFFERENTIAL EQUATIONS, VECTOR CALCULUS AND ABSTRACT ALGEBRA
COURSE CODE	MM 1431.2
CREDIT	4
HOURS	5
COURSE OUTCOMES	
CO1	Apply algebraic way of thinking
CO2	Solve linear first order ordinary differential equations
CO3	Demonstrate various applications of integration

COURSE TYPE	COMPLEMENTARY COURSE VIII
COURSE NAME	ATOMIC PHYSICS, QUANTUM MECHANICS AND ELECTRONICS
COURSE CODE	PY1431.2
CREDIT	3
HOURS	5
COURSE OUTCOMES	
CO1	Distinguish different atom models
CO2	Obtain the theoretical aspects of different types of superconductors and its applications
CO3	Understand the concepts Quantum Mechanics, Planck's hypothesis and applications
CO4	Understand different Spectroscopic techniques
CO5	Obtain the theoretical concept of working of various electronic circuits
CO6	Obtain the knowledge about basics of Digital electronics and its applications

Semester 5

COURSE TYPE	CORE COURSE V
COURSE NAME	PHYSICAL CHEMISTRY I
COURSE CODE	CH 1541
CREDIT	4
HOURS	3
COURSE OUTCOMES	
CO1	Identify, compare and explain the properties and behaviour of ideal and real gases, knowing kinetic theory of gases and different types of molecular velocities and collision properties.
CO2	Perform numerical problems of gases under a set of conditions
CO3	Differentiate between amorphous and crystalline solids, understand anisotropy, symmetry and types of crystals, X-ray diffraction methods of study of crystal structure, identify the imperfections in crystals understand the physical aspects of surface tension and viscosity of liquids and the basics of liquid crystals and their applications
CO4	representation of lattice planes and calculation of interplanar spacing, draw the crystal structures of NaCl and CsCl
CO5	Recalling the basic concepts of solutions, concentration terms, Raoult's law and colligative properties
CO6	Determination of colligative properties and molecular mass of solute
CO7	Understand the working principle Electro-Chemical cells
CO8	Design and Determine the potentials of electrochemical systems
CO9	Assess the nature of electrolytes in terms of dissociation and ionic conductance of electrolytes in terms of mobility of ions
CO10	Integrate the theory into practical applications of conductometric titrations

COURSE TYPE	CORE COURSE VI
COURSE NAME	INORGANIC CHEMISTRY III
COURSE CODE	CH 1542
CREDIT	4
HOURS	4
COURSE OUTCOMES	
CO1	Discuss the electronic configuration and related properties of transition elements and inner transition elements

CO2	Understand preparation of selected transition metal compounds, lanthanides and actinides
CO3	Compare lanthanide and actinide contraction and their consequences.
CO4	Name coordination complexes, organometallics, discuss their properties and bonding
CO5	Understand stability of complexes and factors affecting stability
CO6	Describe isomerism in coordination compounds
CO7	Discuss spectrochemical series, CFSE and their consequences
CO8	Correlate geometry, stability and Jahn Teller effect and its causes
CO9	Discuss reaction mechanisms and applications of coordination compounds
CO10	Name and classify organometallic compounds
CO11	Discuss preparation and properties and bonding of carbonyls
CO12	Identify the role of organometallic compounds in organic synthesis
CO13	Discuss the role of inorganic ions in biological systems and biochemistry of haemoglobin, myoglobin, cytochromes, iron sulphur proteins
CO14	Discuss various bioinorganic processes like photosynthesis, working of sodium potassium pump, etc
CO15	Describe various aspects of metallurgy and instrumental methods of analyses viz., spectrophotometric methods, thermal methods and tools available to measure nanomaterials

COURSE TYPE	CORE COURSE VII
COURSE NAME	ORGANIC CHEMISTRY II
COURSE CODE	CH 1543
CREDIT	4
HOURS	4
COURSE OUTCOME	
CO1	Describe the preparation of hydroxy, carbonyl & amino compounds, carboxylic acids and organo Mg, Li & Zn compounds.
CO2	Distinguish primary, secondary & tertiary alcohols and amines
CO3	Write reaction steps in ascending & descending of alcohol and aliphatic acid series, interconversion of aldose and ketose, chain lengthening and shortening of aldoses.
CO4	Explain the structure of glucose, fructose, sucrose, starch and cellulose.

CO5	Predict the outcome and mechanism of simple organic reactions, using a basic understanding of the reactivity of functional groups
CO6	Illustrate the use of organic reagents in synthesis.
CO7	Discuss fundamental principles of supramolecular and green chemistry

COURSE TYPE	CORE COURSE VIII LAB COURSE II
COURSE NAME	INORGANIC VOLUMETRIC ANALYSIS
COURSE CODE	CH1544
CREDIT	3
HOURS	5
COURSE OUTCOMES	
CO1	Develop skill in selecting, primary and secondary standards
CO2	Develop skill in weight calculation of primary standards weighing by electronic balance, making of solutions of definite strength (standard solutions)
CO3	Use sophisticated glass wares, calibrate apparatus and develop skill in keen observation, prediction and interpretation of results
CO4	Perform volumetric titrations under acidimetry, alkalimetry, permanganometry, dichrometry, iodimetry, iodometry, cerimetry, argentometry and complexometry
CO5	Compare the advantages and disadvantages of different volumetric techniques
CO6	Practice Punctuality and regularity in doing experiments and submitting Lab records

COURSE TYPE	CORE COURSE IX LAB COURSE III
COURSE NAME	PHYSICAL CHEMISTRY EXPERIMENTS
COURSE CODE	CH1545
CREDIT	2
HOURS	4
COURSE OUTCOME	
CO1	Develop Scientific outlook and approach in applying principles of physical chemistry in chemical systems/reactions
CO2	Use computational methods for plotting graph
CO3	Describe systematic procedures for physical experiments
CO4	Acquire Instrumentation skill in using conductometer, potentiometer, refractometer, stalagmometer and Ostwald's viscometer.

CO5	Compare theory with experimental findings
CO6	Practice Punctuality and regularity in doing experiments and submitting Lab records

COURSE TYPE	OPEN COURSE
COURSE NAME	FUNDAMENTALS OF CHEMISTRY AND ITS APPLICATION TO EVERYDAY LIFE
COURSE CODE	CH 1551.2
CREDIT	2
HOURS	3
COURSE OUTCOME	
CO1	Appreciate the evolution of Science and Chemistry and the early form of chemistry
CO2	Understand the development of Chemistry as a discipline and the role of chemistry as a central science
CO3	Discuss the fundamental properties of atom, structure of atom, classification of elements in to a periodic table
CO4	Differentiate between simple molecules and giant molecules and the bonding nature
CO5	Explain different types of bonding and predict stability
CO6	Compare properties of graphite and diamond and their structural differences
CO7	Identify house hold chemicals, their advantages and disadvantages
CO8	Become aware of chemical hazards and the precautions in handling chemicals
CO9	Beware of food adulterants
CO10	Critically select chemical fertilizers, artificial sweeteners, beverages, and food preservatives

COURSE TYPE	PROJECT
COURSE NAME	PROJECT
COURSE CODE	PS 1645
CREDIT	3
HOURS	3
COURSE OUTCOMES	
CO1	Gain knowledge on a topic of choice.
CO2	Research and analyse the content or matter.
CO3	Assimilate and present the matter in specific model.

Semester 6

COURSE TYPE	CORE COURSE X
COURSE NAME	PHYSICAL CHEMISTRY II
COURSE CODE	CH 1641
CREDIT	4
HOURS	3
COURSE OUTCOMES	
CO1	Understand basic concepts of thermodynamics, spectroscopy and group theory
CO2	Apply laws of thermodynamics in physical and chemical processes and real system
CO3	Classify processes, properties and systems on a thermodynamic basis
CO4	Discuss the second law of thermodynamics and assess thermodynamic applications using second law of thermodynamics.
CO5	Discuss basic concepts of statistical thermodynamics
CO6	Solve numerical problems based on thermodynamics and thermochemistry
CO7	Understand the basics of spectroscopic techniques, Rotational, Vibrational and Raman Spectroscopy
CO8	Compare NMR and ESR spectroscopy and their applications
CO9	Evaluate physical and chemical quantities using nonspectroscopic techniques.
CO10	Identify the elements of symmetry and determine the point groups of simple molecules
CO11	Differentiate diamagnetism and paramagnetism, measurement of magnetic susceptibility
CO12	Correlate dipole moment with geometry of molecules

COURSE TYPE	CORE COURSE - XI
COURSE NAME	ORGANIC CHEMISTRY - III
COURSE CODE	CH 1642
CREDIT	4
HOURS	4
COURSE OUTCOMES	
CO1	Outline the chemistry of simple heterocyclic compounds
CO2	Classify amino acids, proteins, nucleic acids, drugs, terpenes, vitamins, lipids and polymers.
CO3	Discuss the synthesis of amino acids, peptides, drugs and polymers.

CO4	Describe the isolation and structure of terpenes and alkaloids.
CO5	Explain the mechanism and techniques of polymerisation.
CO6	Discuss the principle of UV, IR, NMR and Mass spectroscopy.
CO7	Interpret spectroscopic data to elucidate the structure of simple organic compounds.
CO8	Use the simple organic reactions to elucidate the structure of quinoline, piperine and conine.

COURSE TYPE	CORE COURSE-XII
COURSE NAME	PHYSICAL CHEMISTRY III
COURSE CODE	CH 1643
CREDIT	4
HOURS	4

COURSE OUTCOMES

CO1	Recall the basic physical concepts in quantum mechanics, colloids, adsorption, Chemical Kinetics, catalysis, chemical and ionic equilibria, phase equilibria, binary liquid systems and photochemistry
CO2	Understand the basic concepts involved in quantum mechanics, colloids, adsorption, Chemical Kinetics, catalysis, chemical and ionic equilibria, phase equilibria, binary liquid systems and photochemistry
CO3	Derive and Interpret important theories and equations involved in physical chemistry
CO4	Demonstrate the origin of quantum numbers by correlating the Cartesian and spherical polar coordinates of hydrogen atom.
CO5	Identify and recognize the applications of various principles, equations and physical processes
CO6	Perform calculations involving physical concepts and equations
CO7	Analyze graphical representations (phase diagrams, two and three components, vapour pressure – composition and boiling point – composition, temperature-composition) present in physical chemistry.
CO8	Understand terminology
CO9	Understand the effects of external influence on various chemical processes
CO10	Understand different laws and principles of physical chemistry

COURSE TYPE	CORE COURSE-XIII, LAB COURSE IV
COURSE NAME	ORGANIC CHEMISTRY EXPERIMENTS
COURSE CODE	CH1644

CREDIT	3
HOURS	5
COURSE OUTCOME	
CO1	Develop curiosity in systematically analyzing organic compounds
CO2	Differentiate and identify organic compounds by their characteristic reactions towards standard reagents
CO3	Confirm their findings by preparing solid derivatives, and thus understand reliability of experimental results
CO4	Determine physical constants of organic compounds
CO5	Separate organic compounds by TLC/paper/column chromatographic techniques
CO6	Prepare soaps
CO7	Apply the principles and techniques in organic chemistry, thereby developing skill in designing an experiment to synthesize and purify organic compounds
CO8	Practice systematic scientific procedure and prepare adequate report of them
CO9	Understand the chemistry behind organic reactions

COURSE TYPE	CORE COURSE-XIV, LAB COURSE V
COURSE NAME	GRAVIMETRIC EXPERIMENTS
COURSE CODE	CH1645
CREDIT	2
HOURS	3
COURSE OUTCOME	
CO1	Understand precipitation techniques in quantitative context
CO2	Appreciate the application of silica crucible and sintered crucible in gravimetry
CO3	Practice technique of making, diluting solutions on quantitative basis
CO4	Realise the factors affecting precipitation/crystallisation
CO5	Take precautionary measures in filtration , drying and incineration of precipitates
CO6	Understand the principle of colorimetry to estimate Fe ³⁺ and ammonia
CO7	Practice Punctuality and regularity in doing experiments and submitting Lab records

COURSE TYPE	ELECTIVE COURSE
COURSE NAME	SUPRAMOLECULAR, NANO PARTICLES AND GREEN CHEMISTRY

COURSE CODE	CH1651.1
CREDIT	2
HOURS	3
COURSE OUTCOMES	
CO1	Become aware of pollution caused by industries
CO2	Recognise the necessity of green approaches to protect nature
CO3	Discuss about sustainable development and logical use of natural resources
CO4	Motivated to more ecofriendly life style
CO5	Realises the importance of microscale approaches and nano material research

COURSE TYPE	PROJECT
COURSE NAME	PROJECT
COURSE CODE	CH1646
CREDIT	4
HOURS	3
COURSE OUTCOMES	
CO1	Develop an aptitude for research in chemistry
CO2	Practice research methodology and literature search
CO3	Critically choose appropriate research topic and presentation