COURSE CURRICULUM FRAMEWORK UNDER AUTONOMY

Program: B.Sc
Department: Chemistry

Semester 1		
Course code	**Course Title**	**Credits**
SCHE101	**Concepts of Physical and Inorganic Chemistry-I** Concepts of the Laws of Thermodynamics, Reaction Kinetics, Atomic Structure & Basics of Quantum Mechanics	2
SCHE102	**Concepts of Organic and Inorganic Chemistry-I** Nomenclature, stereo-electronic effects, stereochemistry of simple organic compounds; and modern periodic table, concept of qualitative analysis	2
SCHE1PR	**Practical Coursework in Chemistry - I** Practical Coursework on Chemical Kinetics, Thermodynamics,Titrimetric Calculations, Qualitative & Quantitative Analysis in Inorganic Chemistry, Purification of Organic Compounds and determination of Physical Constants, Factors affecting Nucleophilic Substitution reactions, Virtual Lab Experiments	2

Semester 2		
Course code	**Course Title**	**Credits**
SCHE201	**Concepts of Physical and Inorganic Chemistry-II** States of Matter, Ionic Equilibria, Chemical Bonding and Molecular Structure	2
SCHE202	**Concepts of Organic and Inorganic Chemistry-II** Reactive Intermediates, Aromaticity, Orientation effect in electrophilic aromatic substitution, Acid base Chemistry-various theories with applications & Redox Chemistry	2
SCHE2PR	**Practical Coursework in Chemistry - II** Viscosity, Surface tension, Ionic Equilibria, Indicators, GravimetricAnalysis, Volumetric analysis (Acid-Base & Redox), Basics of Identification of Organic Compounds & virtual laboratory experiment.	2

Semester 3		
Course code	**Course Title**	**Credits**
SCHE301	**Principles of Physical & Analytical Chemistry I** Chemical Thermodynamics and solutions of Electrolytes, Electrochemistry and Photochemistry, Introduction to Analytical Chemistry and Instrumental methods in Titrimetric analysis.	3
SCHE302	**Principles of Inorganic Chemistry I** Chemical bonding, Chemistry of p-block elements, classical methods of analysis	3
SCHE303	**Principles of Organic Chemistry I** Functional group chemistry of alkyl and aryl halogenated and oxygenated organic compounds, Chemistry of Carbonyl compounds and Polymer chemistry.	3
SCHE3PR	**Practical Course work in Chemistry III** Practical I- Instrumental Experiments & Non-Instrumental Experiments Practical II- Qualitative analysis, Gravimetric analysis & Preparation of Organic Derivatives	2.5

Semester 4		
Course code	**Course Title**	**Credits**
SCHE401	**Principles of Physical & Analytical Chemistry II** Phase equilibria, Solid State & Catalysis, Visible Spectroscopy	3
SCHE402	**Principles of Inorganic Chemistry II** Study of transition elements & co-ordination chemistry, some selected topics of p-block chemistry and ions in aqueous medium; general principles of analytical methods of separation with special focus on electrophoresis, solvent extraction and chromatography	3
SCHE403	**Principles of Organic Chemistry II** Functional group chemistry of nitrogen containing compounds; Stereochemistry; Industrial Chemistry	3
SCHE4PR	**Practical Coursework in Chemistry IV** Practical -I - Physical ChemistryInstrumental Experiments & Non-Instrumental Experiments Practical- II- Inorganic Chemistry Inorganic Preparations & Volumetric Estimation PRACTICAL – III: Organic Chemistry 1. Quantitative Separation of binary mixture (Chemical Separation) 2. Detection of Organic Compounds by Micro scale Organic Spotting	2.5

Semester 5		
Course code	**Course Title**	**Credits**
	Title of Course List of Titles of units of the Course	
SCHE501	**Advanced Physical Chemistry-I** Molecular Spectroscopy, Thermodynamics, Kinetics, Nuclear Chemistry and Surface Chemistry	4
SCHE502	**Advanced Inorganic Chemistry-I** Chemical bonding, Solid State materials, Chemistry of f-block elements, Solution chemistry	4
SCHE503	**Advanced Organic Chemistry-I** Nomenclature and Stereochemistry of Organic compounds, Mechanism of Organic reactions, reactions, Photochemistry, Pericyclic reactions and Organometallic Chemistry	4
SCHE504	**Advanced Analytical Chemistry-I** Sampling and Treatment of Analytical Data, Methods of separation-I, Optical methods and titrimetric analysis	4
SCHE5PR1	**Practical Coursework in Physical and Inorganic Chemistry-I**	4
SCHE5PR2	**Practical Coursework in Organic and Analytical Chemistry-I**	4
SCHE5AC	**Pharmaceutical Chemistry, Dyes, Paints & Pigments-I** Pharmacokinetics, Pharmacodynamics & Drug Development, and Nomenclature & Classification of Dyes & Optical brighteners; Fibres; Colour & chemical constitution; Unit Processes & Dye Intermediates	2.5
SCHE5ACPR	**Practical Coursework in Pharmaceutical Chemistry, Dyes, Paints & Pigments-I**	2.5

Semester 6

Course code	Course Title	Credits
	Title of Course List of Titles of units of the Course	
SCHE601	**Advanced Physical Chemistry-II** Electrochemistry, Polymers, Quantum chemistry, Renewable energy resources and NMR	4
SCHE602	**Advanced Inorganic Chemistry-II** Coordination Compounds, Properties of Coordination compounds, Organometallic Chemistry, Inorganic Polymers, pharmaceuticals and nanomaterials.	4
SCHE603	**Advanced Organic Chemistry-II** Nomenclature and Stereochemistry of Organic compounds, Mechanism of Organic reactions, Photochemistry, Pericyclic reactions and Organometallic Chemistry	4
SCHE604	**Advanced Analytical Chemistry-II** Quality concepts, chemical calculations, method validation, Electroanalytical techniques methods of separation - II and Thermal methods	4
SCHE6PR1	**Practical Coursework in Physical and Inorganic Chemistry-II**	4
SCHE6PR2	**Practical Coursework in Organic and Analytical Chemistry-II**	4
SCHE6AC	**Pharmaceutical Chemistry, Dyes, Paints & Pigments-II** Drug Discovery, Design and Development; Chemotherapeutic agents and Nanoparticles in Medicinal Chemistry; and Nomenclature, Classification and Application of Dyes (non-textile); Dye Industry and its Future Prospects	2.5
SCHE6ACPR	**Practical Coursework in Pharmaceutical Chemistry, Dyes, Paints & Pigments-II**	2.5