

Name of the Department : Chemistry
 Programme : UG

S.No	Course Code	Course Name	Course Outcome
SEMESTER I			
1	15UCHC11	Core – I: Foundation Course - Basic Concepts of Chemistry	<ul style="list-style-type: none"> • Understanding the basic concepts of coordination compounds. • Skill to calculate the atomic weight, molecular weight, equivalent weight, normality and mole. • Familiarity with periodicity in properties. • Ability to write IUPAC nomenclature of compounds • Understanding the basic concept of physical chemistry. • Ability to understand the basic concept in organic chemistry
2	15UCHC12	Core-II : Organic, Analytical & Physical chemistry	<ul style="list-style-type: none"> • Understand the preparation and properties of alkane and alkene • Knowing the Concept of Ozone depleting compounds and allylating agent • Role of common ion effect and solubility product in qualitative analysis • Skill in balancing the various chemical equation in various medium • Develop familiarity in vanderwaals equation and compressibility factor • Understanding the behavior of gases at various conditions • Knowing the Application of Brownian movement in the Avogadro's number calculations • Concept understanding through pictorial and graphical representations of the properties of gases
3	15UBYA11/ 15UBTA11	Allied– I: Organic, Inorganic and Physical chemistry-I	<ul style="list-style-type: none"> • Knowing the basic structure of nucleus and its disintegration • Significant knowledge in nuclear fission

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			<p>in the stars and the sun and hydrogen bomb</p> <ul style="list-style-type: none"> • Identifying the role of glucose, fructose, starch and cellulose in the living system • Understanding the preparation, properties and uses of polymer • Gain ideas about the basic principle of chemical bonding • Acquire the concept of hybridization and MO theory for the study of structure and the bonding nature of molecules • Enhance knowledge in the electrical properties of the substance. • Gain knowledge in various types of electrode and its importance in the analysis and in aero space industry
4	15UCHN11	Non-major Elective course -I Industrial chemistry	<ul style="list-style-type: none"> • Understanding the various factor affecting the quality of milk and its products • Knowing the concept of setting of cement and its quality affected by various conditions • Learning the knowledge about the polymers, fibers and their role in day to-day life • Create awareness on the water pollution and its purifications
5	15UCHE11	Enrichment course-I Water Technology	<ul style="list-style-type: none"> • Developing the knowledge about hard water and soft water. • Knowing boiler troubles. • Learning the conditioning methods used for softening of water. • Understanding the chemical analysis of water. • Creating an idea about water pollution and water treatment.
SEMESTER II			

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1.	15UCHC21	Core-III : Organic, Inorganic & Physical chemistry	<ul style="list-style-type: none"> • Gain knowledge about the Organometallic reagent and its role in synthetic chemistry • Application of supramolecules and thiol compound importance in the synthesis • Understanding periodicity of properties and its impact in the ionic and covalent compounds • Learning of Molecular structure through the various bond theories • Acquire knowledge for identifying structure of molecules using parachor, refractive index, viscosity and optical exaltation • Getting more knowledge about the applications of liquid crystals due to its wide range of industrial applications. • Deepening the ideas about catalysis, Types, Theory and applications owing to its scope on research in synthetic chemistry.
2	15UCHC2P	Core-IV : Semi micro Inorganic qualitative analysis (Lab)	<ul style="list-style-type: none"> • Mastering the techniques involved in the qualitative analysis • Get an idea about the interfering and non-interfering anions • Learn the importance of interfering radical elimination before the separation of cation • Knowing the role of common ion effect and solubility product in the separation of cations • Analyse the mixture through simple test like flame test and spot test • Familiarise the effect of acid and base addition in excess or deficient in the analysis • Gaining the way of reporting the mixture in the ordered form

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			<ul style="list-style-type: none"> • Enrich the skill to identify the cation by the systematic procedure.
3	15UBYA21/ 15UBTA21	Allied– II: Organic, Inorganic and Physical chemistry-II	<ul style="list-style-type: none"> • Understanding the theory and classification of dyes • Knowing the application of dyes • Gaining the knowledge in thermodynamics concept • Get idea about the physical significance of entropy and Gibbs free energy • Enhance the concept of acid and bases through various theories and to explain the HSAB concept • Gain awareness in formation theory and control of air pollution, water pollution and green house effect • Develop proficiency in water treatment method and its procedure • Impact of fertilizer in the current scenario and its limitation
4	15UBTA2P/1 5UBYA2P	Allied Practical - Ancillary chemistry practical	<ul style="list-style-type: none"> • Learn the importance of Quantitative analysis • Knowing the different types of Volumetric analysis • Get an idea about the role of indicator at different pH range in the acidimetry and alkalimetry • Enhancing the skill to determine the strength of the solution and its molecular weight • Gaining idea about the oxidation and reduction of ions in redox titrations
5	15UCHE21	Enrichment course-II : Basics of computer in Chemistry	<ul style="list-style-type: none"> • Knowledge about history, development and components of computers • Knowing the different types of computer and programming language • Skill to use the internet and e-mail • In-depth knowledge in MS-word
6	15UCHN21	Non-major Elective	<ul style="list-style-type: none"> • Knowing the manufacturing process of

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		course-II : Applied Chemistry	household materials like wax candles, shoe polish <ul style="list-style-type: none"> • Skill to prepare cleaning powder, washing powder and phenoyls • Gain knowledge about the composition of soap and detergents. • Deepening the knowledge about paint and varnishes.
SEMESTER III			
1	15UCHC31	Core-V : Organic Chemistry - I	<ul style="list-style-type: none"> • Knowing the various preparations of aldehyde • Deliberating the various methods to prepare ketone • Significant knowledge in carboxylic acids • Understanding the stability and conformational analysis of cycloparaffins • Gain knowledge in the separation and distinction of primary, secondary & tertiary amines • Acquire ideas in preparation and properties of amino acids. • Skill to identify the aromatic, anti-aromatic and non-aromatic compounds using Huckel's rule • Deepening the knowledge of preparation and properties of substituted benzene
2	15UCHC32	Core-VI : Chemistry of metallic and nonmetallic compounds	<ul style="list-style-type: none"> • Acquire knowledge about various metallurgical process • Gaining the ideas about the composition and applications of alloys • Apply in-depth knowledge on analytically and industrially oriented inorganic compounds • Gain understanding the role of metal oxide as catalyst in industrial process

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			<ul style="list-style-type: none"> • Knowing the periodic properties of Group-IV elements • Understanding the concept of nitrogen and its compounds role as inorganic reagents • Learn about the pseudohalogen, interhalogen compound • Mastering in the oxyacids and oxides of Group 17 elements
3	15UPHA31	Allied– I: Organic, Inorganic and Physical chemistry-I	<ul style="list-style-type: none"> • Knowing the basic structure of nucleus and its disintegration • Significant knowledge in nuclear fission in the stars and the sun and hydrogen bomb • Identifying the role of glucose, fructose, starch and cellulose in the living system • Understanding the preparation, properties and uses of polymer • Gain ideas about the basic principle of chemical bonding • Acquire the concept of hybridization and MO theory for the study of structure and the bonding nature of molecules • Enhance knowledge in the electrical properties of the substance. • Gain knowledge in various types of electrode and its importance in the analysis and in aero space industry
4	15UCHS31	Skill Based Course –I : Paper And Pulp Technology	<ul style="list-style-type: none"> • Gather the historical development of paper industries in India • Acquire knowledge on the manufacturing process in paper pulp • Learning the chemical process of preparation of sulphite, sodalime and rag pulp • Realise the various process involved in the manufacture of paper and its

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			applications
5	15UCHV31	Value Based Course –I : Match industry	<ul style="list-style-type: none"> • Understand the History and Preparation of Lucifer and Safety Matches • Obtain Knowledge in the preparation, properties of Match Head Chemicals • Know the preparation, properties of Match side chemicals • Realising Manufacturing process of Match Industry.
SEMESTER IV			
1	15UCHC41	Core-VII : Adsorption, chemical kinetics and solid state	<ul style="list-style-type: none"> • Knowing the factors influencing adsorption and its applications • Deliberating first, second, third and pseudo order reactions • Significant knowledge in rate law, rate constant, order and molecularity of reactions • Understanding the theories of reaction rate • Gain knowledge on primary and secondary salt effect • Acquire ideas about X-ray diffraction study of crystals • Skill to identify symmetry elements of crystal systems and calculate Miller indices • Deepening the knowledge of types of crystals
2	15UCHC4P	Core-VIII Volumetric Analysis & complex preparations(Lab)	<ul style="list-style-type: none"> • Learn the importance of Quantitative analysis and complex preparations • Knowing the different types of Volumetrically analysis • Get an idea about the role of indicator at different pH range in the acidimetry and alkalimetry • Enhancing the skill to determine the strength of the solution and its molecular weight

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			<ul style="list-style-type: none"> • Gaining idea about the oxidation and reduction of ions in redox titrations • Expertise the skill in the determination of hardness of water by EDTA method • Develop the synthetic knowledge in the complex preparation • Report the complex preparation through the geometry and the yield comparison with theoretical value
3	15UPHA41	Allied– II: Organic, Inorganic and Physical chemistry-II	<ul style="list-style-type: none"> • Understanding the theory and classification of dyes • Knowing the application of dyes • Gaining the knowledge in thermodynamics concept • Get idea about the physical significance of entropy and Gibbs free energy • Enhance the concept of acid and bases through various theories and to explain the HSAB concept • Gain awareness in formation theory and control of air pollution, water pollution and green house effect • Develop proficiency in water treatment method and its procedure • Impact of fertilizer in the current scenario and its limitation
4	15UPHA4P	Allied Practical - Ancillary chemistry practical	<ul style="list-style-type: none"> • Learn the importance of Quantitative analysis • Knowing the different types of Volumetric analysis • Get an idea about the role of indicator at different pH range in the acidimetry and alkalimetry • Enhancing the skill to determine the strength of the solution and its molecular weight • Gaining idea about the oxidation and reduction of ions in redox titrations

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5	15UCHO41	Optional Course - I 1. Green Chemistry	<ul style="list-style-type: none"> • Knowing the twelve major principles of Green Chemistry • Gaining significant knowledge in methods of practising green chemistry • Gain knowledge in aqueous phase reaction, ionic liquid, solid state and solid support reactions • Acquire ideas about sonication in green synthesis • Gain considerable knowledge in theory, technique and the applications of microwave in dry media synthesis • Gain proficiency in the principle, advantages and applications of PTC
6	15UCHO42	Optional Course - I 2. Medicinal Chemistry	<ul style="list-style-type: none"> • Knowing the definition and classification of drugs • Acquiring significant knowledge in methods of administration, mechanism of action and metabolism of drugs • Understanding different types of analgesics and antipyretic drugs • Acquire ideas about chemotherapy • Gain considerable knowledge about hormones, vitamins and anesthetics • Get proficiency in diagnostic tests, detection of anemia, diabetes and poisons • Skill to identify antidotes for poisoning
SEMESTER V			
1	15UCHC51	Core IX : Organic Chemistry - II	<ul style="list-style-type: none"> • Acquire proficiency in understanding the geometrical and optical isomerism • Skill to identify the configurations for geometrical isomers using E/Z notation and optical isomers using R/S notation • Significant knowledge in conformational analysis of organic compounds • Understanding the reaction, structure

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			and interconversion of monosaccharides <ul style="list-style-type: none"> • Knowing the concept of mutarotation • Acquire ideas about disaccharides and polysaccharides • Skill to manipulate the mechanism of organic name reactions • Expertise on the applications of benzene diazonium chloride • Deepening the knowledge of polynuclear hydrocarbons and their derivatives • Gain meaningful knowledge on chromophore - auxochrome theory and classification of dyes
2	15UCHC52	Core-X : Inorganic chemistry - I	<ul style="list-style-type: none"> • Knowing the theories of coordination compounds • Acquire proficiency in nomenclature of coordination compounds • Deepening the knowledge of extraction of lanthanides lanthanide contraction • Understanding the concept of lanthanide contraction and its consequences • Gain knowledge about preparation, properties and extraction of actinides • Get meaningful idea about volumetric estimations • Significant knowledge in conformational analysis of organic compounds • Understanding the reaction, structure and interconversion of monosaccharides • Knowing the concept of mutarotation • Acquire ideas about disaccharides and polysaccharides • Skill to manipulate the mechanism of organic name reactions • Expertise on the applications of

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			benzene diazonium chloride <ul style="list-style-type: none"> • Deepening the knowledge of polynuclear hydrocarbons and their derivatives • Gain meaningful knowledge on chromophore - auxochrome theory and classification of dyes
3	15UCHC53	Core-XI : Thermodynamics & Photo chemistry	<ul style="list-style-type: none"> • Knowing the importance of I law of thermodynamics • Understanding the concept of Cp, Cv and - Joule Thomson effect. • Deepening the knowledge on I law of thermodynamics and efficiency of heat engine. • Acquire proficiency in chemical potential • Gain knowledge about van't Hoff reaction isotherm, van't Hoff isochore, and Lechatelier principle • Understanding the concept of Nernst heat theorem. • Get meaningful idea about various laws of photochemistry • Gain significant knowledge in Quantum yield • Understanding the various photophysical process by Jablonski diagram • Knowing the concept of Photo chemical kinetic reaction.
4	15UCHO51	Optional Course – II 1. Perfume and sweetening	<ul style="list-style-type: none"> • Knowing the various alcohols and ketones used in the perfume industry • Acquire significant knowledge in methods of production of natural perfumes • Understanding the essential oils and its importance. • Acquire ideas about various flavours

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			<p>used in perfume industry.</p> <ul style="list-style-type: none"> • Gain considerable knowledge about sweetening agents used in perfume industry • Get proficiency in flavouring components.
5	15UCHO52	Optional Course – II 2. Polymer chemistry	<ul style="list-style-type: none"> • Knowing the polymers and its types • Significant knowledge in the mechanism of polymerization • Acquire ideas about various polymerization techniques • Understanding the application of polymer in day to-day life • Acquire ideas about molecular weight determination of polymers • Gain considerable knowledge in properties of polymers • Gain knowledge about preparation and uses of individual polymers. • Expertise on processing technique in polymers
6	15UCHS51	Skill Based Course – I Nano Chemistry	<ul style="list-style-type: none"> • Getting the knowledge about various types of nanomaterials • Gaining idea about the types of nano composite • Acquire in-depth knowledge on various synthetic route for nano materials • Knowing the properties of nanomaterials. • Understanding the instrumentation techniques like TEM, SEM, EDAX, UV - DRS.
7	15UCHS52	Skill based course –III : Drug Chemistry	<ul style="list-style-type: none"> • Getting the ideas about important terminologies in drug • Gaining the knowledge on various antibiotics. • In-depth knowledge on different systems of medicines

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			<ul style="list-style-type: none"> • Knowing the role of vitamins in body 's health . • Understanding the Analgesic and antipyretic drugs • Gain considerable knowledge in various anasthetics
SEMESTER VI			
1	15UCHC61	Core-XV : Organic Chemistry – III	<ul style="list-style-type: none"> • Acquire proficiency in molecular rearrangement • Significant knowledge in preparation, detection and stability of free radicals. • Understanding the theory and principle of UV and IR spectroscopic techniques • Skill to calculate λ_{\max} of conjugated dienes and conjugated dienones using Woodward Fieser rule. • Knowing the theory, principle and instrumentation technique of NMR spectroscopy. • Skill to solve the organic problems using UV, IR and NMR spectroscopy. • Significant knowledge in nomenclature, preparation and properties of heterocyclic compounds • Understanding the structure, classification and synthesis of Alkaloids. • Acquire knowledge in the classification, properties, structure and synthesis of terpenes. • Gain ideas about the primary, secondary, tertiary and quarternary structure of proteins • Understanding the structure of RNA and DNA.
2	15UCHC62	Core-XVI :Concept of Bio-inorganic,	<ul style="list-style-type: none"> • Knowing the various concepts of acids and bases.

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		organometallic & Environmental chemistry	<ul style="list-style-type: none"> • Deepening the knowledge of non – aqueous solvents • Understanding the importance of porphyrin ring in the living system. • Gain knowledge about structure of myoglobin and hemoglobin and their role in biological system • Acquire knowledge in electron transfer agents. • Develop basic knowledge about Role of alkali and alkaline earth metal ions in biological systems • Gain significant knowledge in nomenclature, classification, preparation and properties of organometallic compounds. • Get an idea about ferrocene • Understanding the various sources of air pollution and water pollution. • Expertise on BOD and COD.
3	15UCHC63	Core-XVII : Electrochemistry, Quantum mechanics & Phase rule	<ul style="list-style-type: none"> • Knowing the importance of Faraday's laws of electrolysis • Understanding the concept of transport number and its determination • Deepening the knowledge on Kohlrausch's law and its application. • Acquire proficiency in Conductometric precipitation titrations • Gain knowledge about various types of reversible electrodes • Understanding the thermodynamical concept of electrochemistry. • Get basic knowledge about Quantum mechanics • Skill to solve problems based on Eigen value equation • Understanding the basic concepts of Gibbs phase rule

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			<ul style="list-style-type: none"> • Knowing the concept one component system.
4	15UCHC6P	Core-XII : Organic qualitative analysis & estimations(Lab)	<ul style="list-style-type: none"> • Learn the importance of Quantitative and qualitative organic analysis • Knowing the confirmation of the sample through the functional group and its derivative • Get an idea about the hydrocarbon, nitrogen, carbonyl compounds and its analysis • Enhancing the skill for the estimation through iodometric analysis • Gaining idea about the bifunctional group analysis • Expertise the skill to distinguish primary, secondary and tertiary amine compounds • Develop the synthetic knowledge in the derivative preparation • Report the sample in a systematic way of proceedings
5	15UCHC6Q	Core-XIII : Physical chemistry Practicals (Lab)	<ul style="list-style-type: none"> • Knowing the importance of the various physical properties by practical • Skill to determine the molecular weight of unknown substance by rasi method and transition temperature method • Pursuing the role of phase diagram to understand the simple eutectic method • Ability to know the effect of impurity in the strength of the substance by CST method • Enrich the concept of thermodynamics through heat of solution determination • Finding the composition of mixture through viscosity method • Application of Nernst distribution law in the determination of partition coefficient

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			<ul style="list-style-type: none"> • Rate of the reaction study through kinetic method • Impact of the conductivity and potentiometry methods to study the electrical properties of the ionic substance, acids and bases
6	15UCHC6R	Core-XIV : Gravimetric & organic preparations (Lab)	<ul style="list-style-type: none"> • Understand the step to be followed for the preparation of Gravimetric precipitate • Impact of the effect of acid and base addition in excess or deficient in the analysis • Role of organic complexing agent in the precipitation of metal ions as complex through gravimetry • Get proficiency in the role of co-precipitation and post precipitation in gravimetric analysis • Preparation of disubstituted and trisubstituted organic compound • Understand the role of electrophilic and nucleophilic substitution reagent in the synthetic reaction • Applying the knowledge of directive influencing effect in the organic compound preparation • Learn how to convert the monosubstituted compound into di and tri substituted compound
7	15UCHO61	Optional / Elective Course – III 1. Chromatographic Techniques	<ul style="list-style-type: none"> • Knowing the principle and classification of chromatographic technique • Significant knowledge in adsorption and partition chromatography • Understanding the principle of column chromatography.

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			<ul style="list-style-type: none"> • Acquire ideas about applications of size exclusion, ion exchange chromatography. • Gain considerable knowledge in gas chromatography • Get proficiency in Separation of enantiomers by chiral HPLC
8	15UCHO62	Optional / Elective Course – III 2.Analytical chemistry	<ul style="list-style-type: none"> • Knowing the conditions for gravimetric precipitation. • Significant knowledge in co-precipitation, post precipitation and precipitation from homogeneous solution. • Acquire skill in Understanding significant figures. • Understanding the principle and application of TGA, DSC and DTA.. • Gain ideas about the principle and application of AAS and flame photometry. • Get proficiency in fluorimetry, turbidimetry and nephelometry
9	15UCSS6P	Skill Based Course –IV: Sugar Chemistry	<ul style="list-style-type: none"> • Knowing the sugar Industry in India. • Significant knowledge in recovery of sucrose from molasses Defection. • Understanding the concept of sulphitation and carbonation process. • Gain ideas about testing and estimation of sucrose. • Get knowledge in the preparation and uses of bagasse and alcohol.
10	15UCSV61	Value Based Course – II: Pyrotech	<ul style="list-style-type: none"> • Knowing the various oxidizers used in pyrotech industry.. • Significant knowledge in colour producers and colour intensifiers • Awareness about the various physical factors responsible for accidents

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			<ul style="list-style-type: none">• Understanding the safety measures to be adopted in pyrotech industries.• Gain ideas about the manufacturing of fireworks products