



G.VENKATASWAMY NAIDU COLLEGE (Autonomous), KOVILPATTI.

Affiliated to Manonmaniam Sundaranar University – Tirunelveli.

(Re-Accredited with 'A' Grade by NAAC)

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(Under the Management of The Kuppasamy Naidu Charity Trust for Education and Medical Relief, Coimbatore-37)

Programme Outcomes - Department of Chemistry (UG)

GPO No.	Programme Outcomes
PO1	understand, demonstrate, analyze and apply the major concepts in all disciplines of Chemistry and will be able to nurture the needs of the industries/ laboratories related to Chemistry and Allied fields.
PO2	understand the basic principle of instruments/equipments used in Chemistry lab, carry out experiments, observe and interpret the results and make necessary inferences/ conclusions and also apply the experimental results to improve the chemical processes.
PO3	explore the vast field of theoretical and experimental Chemistry by employing Scientific knowledge, evidence based scientific approach, scientific inquiry and critical thinking
PO4	demonstrate skills in the safe handling of chemicals, considering their physical and chemical properties including any specific hazards associated with their use.
PO5	follow the ethical principles and responsibilities of a Chemist to serve the Society by following the alternate green routes for Chemical reactions for sustainable development.
PO6	demonstrate a good working knowledge in the use of computers and will be able to increase the core competency by constantly upgrading skills with independent lifelong learning via e-resources
PO7	assimilate chemical information from various sources and present it to an audience both orally and in writing and demonstrate problem solving, decision making and leadership skills and will be able to work in teams.



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Programme Specific Outcomes - Department of Chemistry

PSO No.	Intended Programme Specific Outcomes
PSO1	apply various concepts and principles of organic, inorganic, physical chemistry in day to day life.
PSO2	design, execute /conduct / experiments and handle equipments in Chemistry for industries.
PSO3	execute new ideas in the field of research and development using principles and techniques of Chemistry learned through activities such as expert lecturers, workshops, seminars and project.



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Course Outcome - Department of Chemistry

First Semester

Core – 1

Inorganic Chemistry I (U20CH101)

CO No.	Course Outcome
CO1	recall the basic concepts of atomic structure, periodic table, periodic properties, chemical bonding and properties of s and p block elements
CO2	understand the arrangement of elements in the periodic table, the periodicity in properties, principles of bonding and the general characteristics and properties of s and p block elements
CO3	apply Pauli's exclusion principle, Hund's rule and Aufbau principle to filling up of atomic orbitals. the concept of hybridization to geometry of molecules, VBT, MOT and VSEPR theory to molecules
CO4	analyze various atom models, theories of chemical bonding, the position of elements in the P.T., the general characteristics of s block and p block elements and their preparation and properties
CO5	Evaluate and justify the position of elements in the P.T.

Core – 2

Physical Chemistry I (U20CH102)

CO No.	Course Outcome
CO1	recall the concepts of gaseous state, photochemistry, nuclear chemistry, solid state and dilute solutions
CO2	differentiate various states of matter and thermal and photochemical reactions,
CO3	explain the principles of radioactivity
CO4	Analyze the crystal structure and crystal defects in solids
CO5	evaluate and explain the properties of dilute solutions



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Core Practical I Inorganic Quantitative Analysis (Volumetric method) U20CH2P1)

CO No.	Course Outcome
CO1	recall the principles of volumetric titrations
CO2	demonstrate the experimental skills in volumetric titration
CO3	apply the volumetric formula to calculate strengths of solutions
CO4	analyze the theory of indicators and employ it in volumetric titrations
CO5	evaluate and interpret the results of Volumetric Analysis

Elective Generic -I Allied Chemistry I (U20CH1A1)

CO No.	Course Outcome
CO1	Recall the atomic structure, bonding, Hybridization and VSEPR theory, Heterolytic and Homolytic cleavage, Neucleophiles and electrophiles, Carbonium and carbanions, photochemistry, Photochemical process, Polymers, Lubricants.
CO2	Understand the atomic structure, bonding, Hybridization and VSEPR theory, Heterolytic and Homolytic cleavage, Neucleophiles and electrophiles, Carbonium and carbanions, photochemistry, Photochemical process, Polymers, Lubricants.
CO3	Apply the rules for writing electronic configuration of an atom, orbital overlapping, Illustrate the Heterolytic and Hemolytic cleavage, identify Neucleophiles and electrophiles Properties of reaction intermediate, Laws of photochemistry, Preparation and properties and uses of polymers, Criteria of good lubricating oils, Advantages and disadvantages of various types lubricants.
CO4	To study about various types of Bonding, Classification of reaction intermediates, comparison of thermal and photochemical reactions, different types of polymers and polymerization



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	reactions, Bonding, classification of polymers and Lubricants.
CO5	Explain Hybridization, VSEPR theory, various types of reactions and reaction intermediates, Photochemical process and photochemical reactions, Quantum yield. Thermoplastics and thermosetting plastics, Elastomers. Preparation and uses of some chemicals used in our day- to-day life

Elective Generic Practical-I Inorganic Quantitative Analysis (Volumetric Method) and Organic Analysis (U20CH2AP)

CO No.	Course Outcome
CO1	understand the concept of volumetric titrations and carry out volumetric titrations
CO2	demonstrate the experimental skills in volumetric titration and organic analysis
CO3	apply the volumetric formula to calculate the strengths of solutions, observe, infer and thereby identify the functional group present in the organic compound
CO4	analyse and apply the theory of indicators in volumetric titration
CO5	Evaluate and interpret the results in volumetric and organic analyses

Second Semester

Core – 3

Inorganic Chemistry II (U20CH203)

CO No.	Course Outcome
CO1	remember the chemistry of noble gases, d and f block elements, principles of metallurgy and theory of practical's
CO2	explain the properties of noble gases, d and f block elements, principles of metallurgy and theory of practical's
CO3	apply the knowledge of solubility product and common ion effect in inorganic qualitative analysis and inorganic quantitative



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	estimations
CO4	analyze the theory of inorganic practical's, principles of metallurgy, general properties odd and f block elements
CO5	justify the position of noble gases, d and f block elements in the periodic table

Core – 4 Organic Chemistry I (U20CH204)

CO No.	Course Outcome
CO1	recall the classification and nomenclature of organic compounds
CO2	understand the electronic theories of organic compounds
CO3	apply markownikoff rule and peroxide effect to the addition reactions of unsymmetrical olefins
CO4	analyze the electrophilic and nucleophilic substitution reactions, addition and elimination reactions
CO5	compare and distinguish primary, secondary and tertiary alcohols and differentiate between alcohols and ethers

Elective Generic –II Allied Chemistry II (U20CH2A2)

CO No.	Course Outcome
CO1	recall the preparation, properties and structure of aromatic compounds. and the classification of carbohydrates, amino acids and proteins
CO2	summarize the applications of radio isotopes.
CO3	apply the knowledge about common diseases and drugs in common ailments encountered in daily life
CO4	Analyze the composition of fuels, fertilizers, soaps, cement and glass
CO5	explain the Chemistry of carbohydrates, amino acids, proteins and nucleic acids



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Third Semester

Core – 5

Organic Chemistry II (U20CH305)

CO No.	Course Outcome
CO1	Remember the structure and Name reactions of aldehydes, ketones, carboxylic acids, organometallic, organosulphur and alicyclic compounds and uses of Acrolein, dicarboxylic acids etc, Tautomerism
CO2	Understand the preparation, properties of aldehydes, ketones, carboxylic acids, organometallic, and alicyclic compounds, theories of cycloalkanes, Tautomerism, acid derivatives
CO3	Apply knowledge to the structure and chemical reactions of aldehydes, ketones, carboxylic acids, Nomenclature and theories of alicyclic compounds and synthetic applications of active methylene compounds, active methylene compounds
CO4	Analyze the structure and chemical reactions of acrolein, crotonaldehyde, sulphonol, organosulphur compounds and Examine the general preparations and properties of Cyclo alkanes and their derivatives and conformation of cycloalkanes, classification of various types Tautomerism
CO5	Evaluate the mechanism of esterification, ester hydrolysis, Name reactions etc. Discuss the relative stability theories of cyclo alkanes, Explain the Synthesis and structure of civetone and muscone, , urea

Core Practical II

Inorganic Qualitative Analysis (U20CH4P2)

CO No.	Course Outcome
CO1	recall the procedure for analysis of anions and cations
CO2	demonstrate the experimental skills in Inorganic Qualitative Analysis
CO3	apply the principles of common ion effect and solubility product



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	to the selective precipitation of cations
CO4	analyze and employ the principles of common ion effect and solubility product in Inorganic Qualitative Analysis
CO5	evaluate the observations and interpret the results

EEC 1

Applied Chemistry (U20CH3EEA)

CO No.	Course Outcome
CO1	Recall and relate the knowledge about soap, detergents, fertilizers, fibers, resins, plastics, Antiseptics, Mouth washes, Antacids, Analgesics, Antibiotics, Haematinics, Laxatives, Sedatives Tooth powder, tooth paste, writing inks, gum paste, boot polish, talcum powder, chalk crayons, agar battis, phenyl and moth balls in a broader context
CO2	understand the manufacture and cleaning action of soap, detergents, characteristics and types of fertilizers and polymers, therapeutic uses of some common pharmaceuticals and preparations of chemicals used in our day-to-day life
CO3	Apply the knowledge in the preparation in small scale of soap, chemical fertilizers, and uses of polymers, antibiotics, some of the chemicals used in daily life. To study about the characteristics of a good fertilizers,
CO4	Classifications of soap and detergent, fertilizers, plastics, fibers, resins advantages of detergents over soap, Types of rubber and defects in natural rubber. vulcanization
CO5	explain the manufacture and cleaning action of soap, Explain the role of NPK, bio fertilizers, types of plastics and rubber, and applications of some common pharmaceuticals and the preparation and uses of chemicals used in daily life



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EEC 1

Agro Chemistry (U20CH3EEB)

CO No.	Course Outcome
CO1	Remember the of soil, fertilizer and pesticides
CO2	Role of N,P,K in plant growth
CO3	To examine the texture of soil
CO4	analyze the soil characteristics and draw conclusions about the nature of the soil
CO5	evaluate the nature of the soil by soil parameters

Fourth Semester

Core – 6

Inorganic Chemistry III (U20CH406)

CO No.	Course Outcome
CO1	recall the basic terminology in coordination chemistry, EAN rule application and limitation of CFT, types of ligands, classification of complexes. spin – only magnetic moment of simple coordination compounds
CO2	understand the IUPAC nomenclature of coordination compounds, Naming of ligands, isomerism
CO3	apply the knowledge of CFT and VBT concepts to square planar and octahedral complexes
CO4	analyze the structure and nature of M-L bond in metal carbonyls. Photochemical pathways, stability of complexes and various ligand substitution reactions in octahedral and square planar geometry
CO5	Evaluate Photochemical conversion and storage of solar energy: photolytic cleavage of water into H ₂ and O ₂ - photo electrochemical devices: photo galvanic cells and semiconductor based photo voltaic cells.



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Core - 7 PHYSICAL CHEMISTRY -II (U20CH407)

CO No.	Course Outcome
CO1	outline the basic concepts, definitions and statements of thermodynamics, different types of systems, processes, variables, kinds of solutions, strong and weak electrolytes
CO2	understand the concept of entropy, Ideal behavior of solutions, molar conductivity, and deviation from Ideal behavior of solutions
CO3	apply the Law of mass action, Le Chatelier's principle to different systems, sketch Hittorf's device, CST-types with examples
CO4	Compare reversible and irreversible reactions, calculate the equivalent conductance of weak electrolytes, Relationship between C_p , C_v & K_p , K_c
CO5	Determine transport number by moving boundary method, Debye-Huckle-Onsager Equation