Department of Chemistry
Sarojini Naidu College for Women

Name of the Academic Program: B.Sc. Honours with Chemistry

Course Code: CEMACOR01T, CEMACOR01P

Course Title: Organic Chemistry -I

Course Outcome (COs)

After completion of this course successfully, the students will be able to

CO-1:	describe the basics of chemical bonding in organic molecules and related physical properties
CO-2:	understand the basics organic reaction mechanism and reaction intermediates
CO-3:	memorize the basic concepts of Stereochemistry
CO-4:	identify pure single organic compounds
CO-5:	separate organic compounds from mixture and determine the boiling point of common organic liquid compounds

Course Code: CEMACOR02T, CEMACOR02P

Course Title: Kinetic Theory and Gaseous State, Chemical Thermodynamics, Chemical Kinetics

Course Outcome (COs)

After completion of this course successfully, the students will be able to

CO-1:	Remember the basic concept of kinetic theory of gases and Chemical Kinetics. [Level 1: Remember]
CO-2:	Understand the basic concept of zeroth, first and second laws of Thermodynamics and Chemical Kinetics [Level 2: Understand]
CO-3:	Apply the learnt concept to solve numerical problems related to those topics.[Level 3: Apply]
CO-4:	Analyze the data obtained from experiments based on the theories [Level 4: Analyze level]

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Name of the Academic Program: B.Sc. Honours with Chemistry

Course Code: CEMACOR03T, CEMACOR03P

Course Title: Inorganic chemistry-I

Course Outcome (COs)

After completion of this course successfully, the students will be able to

CO-1:	Explain the chemical periodicity
CO-2:	Recall the extra nuclear structure of atom
CO-3:	Describe the acid base reaction
CO-4:	Identify redox reactions and precipitation reactions
CO-5:	Estimate mixture of carbonate bicarbonate,carbonate hydroxide,free alkali from acid base titration
CO-6.	Estimate Fe(II)/Fe(II)+Fe(III)/Fe(III)+Mn(II)/Fe(III)+Cu(II)/Fe(III)+Cr(III) using oxidation -reduction titration.

Course Code: CEMACOR04T, CEMACOR04P

Course Title: Organic Chemistry -II

Course Outcome (COs)

After completion of this course successfully, the students will be able to

CO-1:	Discuss configuration and conformations of different organic molecules
CO-2:	Describe the advanced level of organic reaction mechanism including reaction thermodynamics and kinetics, SHAB principles and tautomerism
CO-3:	Describe substitution and elimination reaction
CO-4:	Prepare organic compounds by various reactions
CO-5:	Estimate the yield of the product and purification by crystallization

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Name of the Academic Program: B.Sc. Honours with Chemistry

Course Code: CEMACOR05T, CEMACOR05P

Course Title: Physical Chemistry-2: Transport Processes, Application of Thermodynamics-I, Foundation of Quantum Mechanics

Course Outcome (COs)

After completion of this course successfully, the students will be able to

CO-1:	Remember theories of viscosity, transport properties and ion conductance(level 1: Remember)
CO-2:	Understand the Debye-Huckel Theory of Ion Atmosphere, Foundation of Quantum Mechanics (level2: Understand)
CO-3:	Apply the theories of thermodynamics and conductance to explain the process of Chemical Reactions and conductometric titrations for measurement of solubility product etc. (level 3: Application)
CO-4:	Evaluate rates of chemical reaction, dissociation constant, viscosity coefficient and partition coefficient (level 4: Evaluate)

Course Code: CEMACOR06T, CEMACOR06P

Course Title: Inorganic Chemistry-II

Course Outcome (COs)

After completion of this course successfully, the students will be able to

CO-1:	Describe ionic bonding and covalent bonding..
CO-2:	Explain molecular bonding theory,metallic bond,weak chemical forces.
CO-3:	Recall radioactivity.
CO-4:	Estimate Cu(II), Vitamin-C ,Arsenic ,antimony, chlorine using Iodo/Iodimetric titration.
CO-5:	Estimate of metal content in Cu in brass, Cr and Mn in Steel, Fe in cement.

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Name of the Academic Program: B.Sc. Honours with Chemistry

Course Code: CEMACOR07T, CEMACOR07P

Course Title: Organic Chemistry - III

Course Outcome (COs)

After completion of this course successfully, the students will be able to

CO-1:	Classify alkenes and alkynes and their related reactions
CO-2:	Recognise and explain electrophilic and nucleophilic aromatic substitution reaction
CO-3:	Discuss various reactions and mechanisms of carbonyl and related compounds
CO-4:	Understand role of organometallic compound in organic reactions
CO-5:	Analyze special elements (N, S, Cl, Br) and functional groups in organic molecule

Course Code: CEMACOR08T, CEMACOR08P

Course Title: Physical Chemistry-III: Application of Thermodynamics-II, Phase Rule, Binary solutions; Electrical Properties of Molecules, Quantum Chemistry

Course Outcome (COs)

After completion of this course successfully, the students will be able to

CO-1:	Apply the theories of Thermodynamics to understand the properties of solution, phases etc. (level 3, Apply level)
CO-2:	Understand the transport of Ions in solution, Idea of Activity,Debye-Huckel Limiting Law, Electromotive Force and Electrical Potential, Different types of electrochemical cells, Dipole moment and polarizability (Understand-Level 2)
CO-3:	Understand the ideas of Quantum Chemistry, like Angular Momentum, Eigenfunction etc.(Level-2- Understand)
CO-4:	Apply the learnt concept to understand the Qualitative Treatment of Hydrogen Atom and Hydrogen like ions, wave function of one-electron atoms, LCAO and HF-SCF, Born-Oppenheimer Approximation (Level-3;Apply)
CO-5:	Apply the learnt concepts to determine the solubility and solubility product of a sparingly soluble salt; Potentiometric titration, phase diagram. (Level-3; Apply)

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Name of the Academic Program: B.Sc. Honours with Chemistry

Course Code: CEMACOR09T, CEMACOR09P

Course Title:Inorganic Chemistry - III

Course Outcome (COs)

After completion of this course successfully, the students will be able to

CO-1:	Practice general principles of Metallurgy.
CO-2:	Describe chemistry of s and p block elements, Illustrate Noble gases, Discuss Inorganic Polymers
CO-3:	Explain the basics of coordination chemistry.
CO-4:	Estimate Zn(II), Zn in a Zn(II) and Cu(II) mixture, Ca(II) and Mg(II) in a Mixture, Hardness of water by Complexometric titrations.
CO-5:	Prepare some Inorganic Metal-Organic Complexes.

Course Code: CEMACOR10T, CEMACOR10P

Course Title: Organic Chemistry- IV

Course Outcome (COs)

After completion of this course successfully, the students will be able to

CO-1:	Discuss nitrogen compounds such as amines, nitro, alkylnitrile, isonitrile and diazonium compounds
CO-2:	Describe different rearrangement reactions and their mechanisms
CO-3:	Design various organic compounds via retrosynthetic approach and discuss about asymmetric synthesis
CO-4:	Analyze and identify of organic compounds by UV, IR and NMR spectroscopic techniques
CO-5:	Estimate different organic molecules like aniline, phenol, glycine, glucose, sucrose, vitamin C etc.

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Name of the Academic Program: B.Sc. Honours with Chemistry

Course Code: CEMACOR11T, CEMACOR11P

Course Title: Inorganic chemistry IV

Course Outcome (COs)

After completion of this course successfully, the students will be able to

CO-1:	Illustrate and interpret the various aspects of metal coordination chemistry.
CO-2:	Compare and discriminate the chemistry of d- and f- block elements.
CO-3:	Separate Ni(II) - Co(II) and Fe(III)-Al(III) by paper chromatographic methods.
CO-4:	Estimate gravimetric estimations of Ni(II) using DMG, Cu as CuSCN, Al(III) by Al(oxine)3, chloride
CO-5:	Evaluate 10Dq by spectrophotometric method, Point out λ_{max} of Mn(acac)3 and Fe(acac)3.

Course Code: CEMACOR12T, CEMACOR12P

Course Title: Organic Chemistry- V

Course Outcome (COs)

After completion of this course successfully, the students will be able to

CO-1:	Differentiate and summarize carbocyclic chemistry and heterocyclic chemistry
CO-2:	Illustrate stereochemistry of alicyclic compounds
CO-3:	Subdivide various pericyclic reactions including electrocyclic, cycloaddition, and sigmatropic reactions
CO-4:	Interpret and comply of carbohydrates, amino acids, peptides and nucleic acids in biochemistry
CO-5:	Demonstrate chromatographic separation and spectroscopic analysis techniques of organic compounds

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Name of the Academic Program: B.Sc. Honours with Chemistry

Course Code: CEMACOR13T, CEMACOR13P

Course Title: Inorganic chemistry V

Course Outcome (COs)

After completion of this course successfully, the students will be able to

CO-1:	Value and draw diagrams of different bio-inorganic compounds.
CO-2:	Summarise and justify Organometallic chemistry.
CO-3:	Construct diagrams of different catalytic reactions by organometallic compounds.
CO-4:	Develop mechanism and reaction kinetics of square planar and octahedral organometallic complexes.
CO-5:	Analyse and identify four inorganic radicals quantitatively. Formulate most probable composition.

Course Code: CEMACOR14T, CEMACOR14P

Course Title: Inorganic chemistry V

Course Outcome (COs)

After completion of this course successfully, the students will be able to

CO-1:	Illustrate the ideas of electromagnetic radiation with molecules , Rotational and vibrational, Raman, NMR, ESR and IR spectroscopy.
CO-2:	Demonstrate the ideas of Photochemistry and laws of Photochemistry.
CO-3:	Apply the laws of photochemistry to analyze different radiative and non-radiative photochemical processes like fluorescence and phosphorescence, pre-dissociation etc.
CO-4:	Evaluate the rate of different photochemical processes.
CO-5:	Analyze different surface phenomena like adsorption, surface tension, electrokinetic phenomena etc.

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Name of the Academic Program: B.Sc. Honours with Chemistry

Course Code: CEMADSE0T1, CEMADSE0P1

Course Title: Advanced Physical Chemistry

Course Outcome (COs)

After completion of this course successfully, the students will be able to

CO-1:	Understand the Structure of Crystal Lattice , laws of Crystallography and Basic Idea of Polymer Structure (level 2: Understand)
CO-2:	Apply the basic idea of Thermodynamics to the theories of Statistical Thermodynamics, Boltzmann Distribution, Partition Function, Heat Capacity of Solids and Third Law of Thermodynamics (level 3: Apply)
CO-3:	Apply Quantum and Statistical Mechanics to determine the Heat Capacity of Solids (level 3: Apply)
CO-4:	Understand Computer Programs on Fortran based on Different Numerical Methods (level2: Understand)

Course Code: CEMADSET2, CEMADSEP2

Course Title: Analytical methods in chemistry

Course Outcome (COs)

After completion of this course successfully, the students will be able to

CO-1:	Recall theories of UV and IR spectroscopy
CO-2:	Interpret IR spectroscopic data
CO-3:	Separate glucose and fructose from a mixture by chromatography
CO-4:	Estimate Calcium, Magnesium and Phosphate in soil

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Name of the Academic Program: B.Sc. Honours with Chemistry

Course Code: CEMADSET3, CEMADSEP3

Course Title: Instrumental methods of chemical Analysis

Course Outcome (COs)

After completion of this course successfully, the students will be able to

CO-1:	Apply theories of UV and IR spectroscopy for analysis of chemical compounds
CO-2:	Interpret Mass spectrometric data
CO-3:	Separate glucose and fructose from a mixture by chromatography
CO-4:	Estimate errors in analysis.

Course Code: CEMADSET4, CEMADSEP4

Course Title: Green chemistry

Course Outcome (COs)

After completion of this course successfully, the students will be able to

CO-1:	To explain principles of green chemistry and designing a chemical synthesis
CO-2:	To justify green synthesis/reactions in some real world cases
CO-3:	To Describe future trends in green chemistry
CO-4:	To prepare different compounds using various green solvents, catalysis, energy etc.

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Name of the Academic Program: B.Sc. Honours with Chemistry

Course Code: CEMADSET6, CEMADSEP6

Course Title: Analytical methods in chemistry

Course Outcome (COs)

After completion of this course successfully, the students will be able to

CO-1:	Recall history of polymeric material and their classification
CO-2:	Generalize functionality, kinetics, crystallinity, nature and structure of polymer
CO-3:	Describe various method of molecular weight and glass transition temperature determination of polymer
CO-4:	Outline polymer solution and properties of various polymers.
CO-5:	Experiment on different kind of polymer synthesis