

Programme outcome and course outcome

B.Sc Honours Program (CBCS)

Generic Elective Chemistry (GE1)

Program specific outcome (PSO)

After completing the Generic Elective as Chemistry study:

- Students will gain a general understanding of Chemistry covering all the aspects viz. inorganic, organic, physical and analytical Chemistry
- Students will be able to carry out chemical experiments qualitatively and quantitatively and apply them in their day to day life.
- Students will be encouraged to continue their higher study.

Course outcome (CO)

GE1T1

Section A: Inorganic Chemistry

- Atomic Structure

Outcomes

Student can learn about

- Different model of atomic structure with proper explanation.
- Quantum number and their significance.
- Orbitals and electronic configuration.

- Chemical Periodicity

Outcomes

Student can learn about

- Periodic table and classification of elements on the basis of electronic configuration.

- Periodic and group wise variation of properties such as atomic and ionic radii, electronegativity, ionization potential, electron affinity.

- Acids and Bases

Outcomes

Student can learn about

- Various concepts of Acids and bases.
- Hard-soft acid bases and their application.

- Redox reactions

Outcomes

Student can learn about

- Balancing of equation by oxidation number.
- Balancing of equation by ion-electron method.

Section B: Organic Chemistry

- Fundamentals of Organic Chemistry

Outcomes

Student can learn about

- Inductive effect, Resonance, Hyperconjugations.
- Cleavage of bonds and structure of organic compounds on the basis of VBT.
- Various reactive intermediates.

- Stereochemistry

Outcomes

Student can learn about

- Different types of isomerism.
- Concept of Chirality and optical activity, Elements of symmetry.
- Various representation and their interconversion.
 - Various nomenclatures
 - Nucleophilic substitution and Elimination Reactions

Outcomes

Student can learn about

- Different types of Nucleophilic and Elimination reactions.

- Aliphatic Hydrocarbons

Outcomes

Student can learn about

- Preparation and reactions of alkanes, alkenes and alkynes.

GE1P1 Lab

Section A: Inorganic Chemistry

Outcomes

Student can gain practical knowledge about Acid-base titration, Redox titration and Iodometric titration.

Section B: Organic Chemistry

Outcomes

Student can gain practical knowledge about qualitative analysis of single solid Organic compounds.

Program specific outcome (PSO)

After completing the General in Chemistry program:

- Students will gain a general understanding of Chemistry covering all the aspects viz. inorganic, organic, physical and analytical Chemistry
- Students will be able to carry out chemical experiments qualitatively and quantitatively and apply them in their day to day life.
- Students will be encouraged to continue their higher study.
- Students will be able to serve Chemical industry.

Course outcome (CO)

CHEMGDS01A(CC-01)

Section A: Inorganic Chemistry-1

- Atomic Structure

Outcomes:

Student can learn about

- Different model of atomic structure with proper explanation.
- Quantum mechanics and H-spectra.
- Orbitals and electronic configuration.
- Chemical Bonding and Molecular Structure

Outcomes:

Student can learn about

- The Concept of ionic bond, Fajans rule, Lattice energy, Concept of covalent bond
VBT and VSEPR theory and MO& LCAO

Section B: Organic Chemistry-1

- Fundamentals of Organic Chemistry

Outcomes:

Student can understand

- Different type of Physical Effects, Electronic Displacements, Strength of Organic acid base, Aromaticity:Huckels rule.

- Stereochemistry

Outcomes:

Student can understand

- Spatial arrangement of molecule Concept of chirality, Isomerism, CIP rule and aliphatic hydrocarbons.
- Aliphatic Hydrocarbons

Outcomes

Student can learn about

- Preparation and reactions of alkanes, alkenes and alkynes.

CHEMGDS01A(CC-01)(P)

Section A: Inorganic Chemistry

Outcomes:

Volumetric Analysis- Student can develop their quantitative analysis skill through volumetric titration.

Section B: Organic Chemistry

Outcomes:

Student will able to detect

- Special element in organic compound.
- Chromatographic separation technique

CHEMGDS-1B (CC-02)

Section A: Physical Chemistry-1

- Chemical Energetic

Outcomes:

Student will develop the knowledge about

- Laws of Thermodynamics, different aspect of enthalpy,
- Kirchoof's equation and third law of Thermodynamics.
- Chemical Equilibrium

Outcomes:

Student can learn about

- Free energy change, Thermodynamic derivation of the law of chemical equilibrium, ΔG , and Le Chatelier's principle K_p , K_c and K_x .
- Ionic Equilibrium

Outcomes:

Student can know about

- Strong, moderate and weak electrolytes, degree of ionization, factors affecting degree of ionization, ionization constant and ionic product of water.

- Ionization of weak acids and bases, pH scale, common ion effect. Salt hydrolysis calculation of hydrolysis constant, degree of hydrolysis and pH for different salts. Buffer solutions. Solubility and solubility product of sparingly soluble.

Section B: Organic Chemistry-2

- Aromatic Hydrocarbon

Outcomes:

Student can learn about

- Preparation and reaction of aromatic hydrocarbon,

- Alkyl and Aryl Halides

Outcomes:

Student can learn about

- Preparation and reactions of alkyl and aryl halides
 - Alcohols, Phenols and Ethers and Aldehydes and ketones.

Outcomes:

Student can learn about

- Preparation and reactions of alcohols, phenols, ethers, aldehydes and ketones.

CHEMGDS1BP

Section A: Physical Chemistry

Outcomes:

Student can develop their skill to determine enthalpy of different system and preparation of buffer.

Section B: Organic Chemistry

Outcomes:

Student can experience the knowledge about Purification of organic compounds, Determination of melting and boiling points and Preparations.

CHEMGDS1CP (CC-03)

Section A: Physical Chemistry-2

- Solutions

Outcomes:

Student will know about

- Thermodynamics of ideal solutions, Raoult's law – nonideal solutions.
- Vapour pressure-composition, Lever rule, Azeotropes, Critical solution temperature,
- Nernst distribution law and solvent extraction.
- Phase Equilibrium

Outcomes:

Student can learn about

- Phases, components and degrees of freedom of a system, Gibbs Phase Rule, Derivation of Clausius – Clapeyron equation, Phase diagrams.

- Conductivity

Outcomes:

Students will gather knowledge about

- Conductivity, Kohlrausch law, Hittorf and Moving boundary methods, Ionic mobility, degree of ionization of weak electrolyte, solubility and solubility products of sparingly soluble salts, ionic product of water, hydrolysis constant of a salt and Conductometric titration.
- Electrochemistry

Outcomes:

Student will know about

- Reversible and irreversible cells, EMF, Nernst equation Standard electrode potential, Thermodynamics of a reversible cell, Liquid junction potential and salt bridge and pH determination using hydrogen electrode and quinhydrone electrode.

Section B: Organic Chemistry-3

- Carboxylic acids and their derivatives

Outcomes:

Student can learn about

- Preparation and reaction of Carboxylic acids and their derivatives.

- Amines and Diazonium Salts,

Outcomes:

Student can learn about

- Preparation and reaction of Amines and Diazonium salts.
- Amino Acids, Peptides and Proteins

Outcomes:

Student can learn about

- Preparation and reaction of Amino Acids, Peptides and Proteins.
- Carbohydrates.

Outcomes:

Student can learn about

- Classification and general properties of carbohydrates
- Structures of disaccharides and polysaccharides
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CHEMGDS-01CP

Section A: Physical Chemistry

Outcomes:

Student can gather practical knowledge about distribution, phase equilibria, conductance, Potentiometry

Section B: Organic Chemistry

Student can gather practical knowledge about some organic synthesis and separation technique.

CHEMDS-1D(CC-04)

Section A: Inorganic Chemistry-3

- Transition elements

Outcomes:

Student can learn about

- The property and reaction of transition elements.

- Coordination Chemistry

Outcomes:

Student can know about

- Co-ordination chemistry, VBT
- Structural and stereochemical isomerism in complexes

- Crystal Field Theory

Outcomes:

Student can know about

- CFSE and comparison of CFSE for O_h and T_d complex

Section B: Physical Chemistry-3

- Kinetic theory of gases

Outcomes:

Students will gather knowledge about

- Nature and behaviour of gases
- Liquids

Outcomes:

Students will gather knowledge about

- Surface tension, viscosity and effect of temperature on these
- Solids

Outcomes:

Students will gather knowledge about

- Forms of solids
- Symmetry elements
- Aspects of Crystallography

- Chemical Kinetics

Outcomes:

Students will gather knowledge about

- Kinetics parameter of chemical reaction.

CHEMDS-1D(CC-04)(P)

Section A: Inorganic Chemistry

Outcomes:

Student can develop their qualitative aptitude for detection of ions with some quantitative estimation of ion.

Section B: Physical Chemistry

Outcomes:

Student can practically learn Surface tension, viscometer and rate determination.

DSE-1T: Analytical Methods in Chemistry

Outcomes:

- Development the aptitude about Qualitative and quantitative aspects of analysis.
- Student can know about different type of spectrophotometric analysis.
- Student can learn about thermogravimetry and different separation technique.

DSE1P: Analytical methods in Chemistry

Outcomes:

Student can gain practical knowledge about

- Chromatography, solvent extraction and spectro photometry.

SEC-2T: Analytical Clinical Biochemistry

Outcomes:

Students will gather knowledge about

- Structure, properties and functions of carbohydrates, lipid and proteins

SEC-2P: Analytical Clinical Biochemistry

Outcomes:

- Students will gather practical knowledge about identification and estimation of carbohydrates, lipid and proteins

SEC-3T: Pharmaceutical Chemistry

Outcomes:

Students will gather knowledge about Drugs, Pharmaceuticals and fermentation

SEC-3P: Pharmaceutical Chemistry

Outcomes:

Students will gather practical knowledge about preparation of Aspirin and antacid.

SEC-4T: Pesticide Chemistry

Outcomes:

Students will gather knowledge about pesticides, their benefits and adverse effects.

SEC-4P: Pesticide Chemistry

Outcomes:

Students will gather practical knowledge about determination of acidity or alkalinity of pesticide and preparation of organophosphates, phosphonates and thiophosphates.