

# DEPARTMENT OF CHEMISTRY

## B.Sc.

### Programme Outcomes (POs)

**At the end of the completion students are able to attain the following attributes**

- **Critical thinking:** Undergraduate program syllabus for different courses are designed by Board of Studies of Hemchand Yadav University, Durg. The combination of different subjects in the courses in graduation level leads to knowledge gathering of students. They develop critical thinking about the subject and are able to check the assumptions and ideas from different perspectives.
- **Effective communication:** Foundation course includes two language papers as Hindi language and English language in the undergraduate programme, which aims for development of communication skills. The students will be able to communicate with people, express ideas through books, media and technology.
- **Social interaction:** In UG programme, the courses include practical's and most of the subjects includes field excursion, and field studies, industrial visits which assist students for participative discussions and interactions with experts, professionals, industrialists, entrepreneurs, social activists etc.
- **Ethics:** College administration induce the ethical conducts to students during the entire stay of students in campus and by conducting induction program in the beginning of session and imparting code of conduct to students from time to time thus helping them to develop ethical values amongst the students.
- **Environment and Sustainability:** As per the supreme court guideline the undergraduate courses incorporate Environmental studies as a subject which imparts studies related to environmental issues and sustainability in which the students are given projects pertaining to the environmental concerns. It leads students to understand the issues of environmental contexts and sustainable development.
- **Effective Citizenship:** During the three-year UG programme, students actively participate in NCC, NSS, Red cross society activities. This participation helps them in developing effective citizenship, awareness of national issues and concerns and to be good citizens.
- **Self-directed and lifelong learning:** Students acquire various traits on completion of the course and program and develop the ability to learn by their own, consequently lifelong learning process is part of the personality.

# DEPARTMENT OF CHEMISTRY

## Course Outcome in Chemistry – B.Sc. Part - I

### PAPER I: INORGANIC CHEMISTRY

- Students will learn atomic structure through basic concepts of Quantum Mechanics
- Students will understand periodic variations in properties of elements
- Students will acquire knowledge about various bonding's and theories of bonding's
- Students will be able to analyse qualitatively cations & anions applying principle of common ion and solubility product.

### PAPER II: ORGANIC CHEMISTRY

- Students will learn basic concepts of Organic Chemistry in reference to hybridization, bonding, stability
- They will acquire understanding in isomerism, stereochemistry, conformational analysis
- They will learn about aliphatic and aromatic hydrocarbons in details.

### PAPER III: PHYSICAL CHEMISTRY

- Students are expected to learn the students are expected to learn the Mathematical concepts
- They will be able to understand gaseous states, colloidal states, solid state chemistry
- They will understand principle of Chemical Kinetics and application of Catalysts in Industry.

### PAPER IV: LABORATORY COURSE

- This laboratory course enables students to determine & analyse: Semi-micro qualitative analysis, Volumetric analysis.
- This course also makes students to learn separation techniques and purification of organic compounds.

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## Course Outcome in Chemistry – B.Sc. Part - II

### PAPER I: INORGANIC CHEMISTRY

- Students will learn basic concepts of coordination chemistry
- Students will understand and will be able to interpret properties of complex formation.
- Students will acquire knowledge about various bonding's and theories of complex formation.
- Students will be able to understand about Lanthanides and Actinides, Acids & Bases, non-aqueous solvents.

### PAPER II: ORGANIC CHEMISTRY

- Students will learn and understand about Organic halides, Alcohols, phenols.
- They will acquire knowledge of mechanism of chemical reactions and kinetics.
- They will learn about Aldehydes ketones, carboxylic acids, nitrogen containing organic compounds.

### PAPER III: PHYSICAL CHEMISTRY

- Students are expected to learn fundamental concepts of Thermodynamics
- They will be able to understand laws of thermodynamics, thermochemistry
- They will understand principle of Chemical dynamics, chemical equilibrium, phase equilibrium
- Students will learn Laws of photochemistry, application in biochemical process.

### PAPER IV: LABORATORY COURSE

- students will have expertise in determination of hardness of water
- Students will be able to describe and classify organic compounds in terms of their functional groups and reactivity.
- They will also learn the paper chromatographic separation of metal ions.
- After completion of this course students will be able to analyse the inorganic sample qualitatively.

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## Course Outcome in Chemistry – B.Sc. Part - III

### PAPER I: INORGANIC CHEMISTRY

- Students will learn through advance concepts of coordination Chemistry
- Students will learn magnetic behaviour of metal ligand complex, electronic spectra of TMC
- Students will acquire knowledge about various bonding's in organometallic compounds and Metal carbonyls
- Students will be able to acquire knowledge about biological process and role of trace elements

### PAPER II: ORGANIC CHEMISTRY

- Students will learn details of Heterocyclic organic compounds
- They will acquire understanding in organometallic reagents and its applications
- They will learn Bioorganic molecules, will be able to apply knowledge about polymers and dyes in industries.
- They will be able to understand concepts of spectroscopy

### PAPER III: PHYSICAL CHEMISTRY

- Students are expected to learn the advance concepts of quantum Mechanics and their applications
- They will be able to understand application of molecular and nuclear Chemistry
- Students will learn principle of electrochemistry and application in Industry and techniques of Corrosion prevention.

### PAPER IV: LABORATORY COURSE

- After completion of this course students will be able to analyse the inorganic sample qualitatively.
- Students will be preparing some inorganic double salts and co-ordination complexes. With these experiments they will learn the synthetic methods for preparing inorganic compounds and characterize those compounds.