



# VIJAYANAGARA SRI KRISHNADEVARAYA UNIVERSITY

Jnana Sagara Campus, Vinayakanagara, Cantonment,  
BALLARI - 583 105.

## Department of Studies in Chemistry

### Programme Outcomes (POs):

At the end of the programme students will be able to:

- **PO1:** Trained the students for skills in synthesis and analysis.
  - **PO2:** The graduates are able to pursue their careers in different fields.
  - **PO3:** The seminars and interactions have improved communication skills and confidence.
  - **PO4:** Special coaching classes have resulted in students clearing KSET/NET examinations.
  - **PO5:** Few students have topped the state level competitive exams in the field related to Chemistry.
  - **PO6:** Placed in various positions related to environmental and quality control of various industries.
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- **PO7:** Project work has motivated many students to opt for higher education and research.

### Course Outcomes (COs):

#### I Semester

**Title of the Course with Code:** CHI HCT: 1.1 -Concepts and Models of Inorganic Chemistry

**After completion of this course students will be able to**

CO	Statement
CO1	Have firm foundation in fundamentals and application of current chemical and

	scientific theories in Inorganic chemistry and learn ionic equilibria, electrical properties of ions in solution and concept of acids and bases.
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**Title of the Course with Code:** CHO HCT: 1.2- Theoretical Organic Chemistry

**After completion of this course students will be able to**

CO	Statement
CO1	Helps in gaining the basic and fundamental aspects of organic chemistry which is essential for advanced studies.

**Title of the Course with Code:** CHP HCT: 1.3- Chemical Thermodynamics and Chemical Kinetics.

**After completion of this course students will be able to**

CO	Statement
CO1	Thermodynamics as well as kinetics of reactions knowledge will be acquired. Catalysis and electrochemistry helps in acquiring fundamentals for industrial applications.

**Title of the Course with Code:** CSA SCT: 1.4- Analytical Chemistry – I

**After completion of this course students will be able to**

CO	Statement
CO1	Have firm foundation in fundamentals and application of analytical chemistry. The fundamentals help in the analytical laboratories and quality control.

## II Semester

**Title of the Course with Code:** CHI HCT: 2.1- Coordination Chemistry

**After completion of this course students will be able to**

CO	Statement
CO1	Will gain in-depth knowledge of d and f block elements, coordination compounds and organometallic compounds which is essential for future career and competitive exams.

**Title of the Course with Code:** CHO HCT: 2.2- Heterocyclic Chemistry, Natural Products Reagents in Organic Synthesis

**After completion of this course students will be able to**

CO	Statement
CO1	This course offers the students to get familiarize with heterocyclic compounds, natural products and reagents in organic synthesis. Heterocyclic compounds play an important role in pharmaceuticals.

**Title of the Course with Code:** CHP HCT: 2.3- Electro-, Quantum- and Photochemistry

**After completion of this course students will be able to**

CO	Statement
CO1	Helps to understand mechanism of the reactions, concepts of the basic reactions as well as applications. Helps for basic understanding and competitive exams.

**Title of the Course with Code:** CSA-SCT 2.4- Analytical Chemistry-II

**After completion of this course students will be able to**

CO	Statement
CO1	Acquire fundamental and basic knowledge of spectroscopy essential to understand advance spectroscopic techniques. Helps in academic, industrial and research.

### III Semester

**Title of the Course with Code:** CHS HCT: 3.1- Spectroscopy – I

**After completion of this course students will be able to**

CO	Statement
CO1	Learn the basic principle and applications of spectroscopy for qualitative and quantitative analysis which helps in the structural determination and also purity of compounds

**Title of the Course with Code:** CHI HCT: 3.2 Nuclear Chemistry and Materials Science

**After completion of this course students will be able to**

CO	Statement
CO1	Acquire the knowledge on various processes in nuclear chemistry and understand the properties and applications of solids for various applications which helps in research and industrial career.

**Title of the Course with Code:** CHP HCT: 3.3 Advanced Physical Chemistry

**After completion of this course students will be able to**

CO	Statement
CO1	Learn the advanced theoretical approaches of Physical Chemistry for advanced applications.

**Title of the Course with Code:** Applied analysis CHP HCT: CSA SCT: 3.4

**After completion of this course students will be able to**

CO	Statement
CO1	Understand the importance and purity of water and food products. Able to analyse the things of daily life

**Title of the Course with Code:** CSE SCT: 3.5 Environmental and Biochemical Analysis

**After completion of this course students will be able to**

CO	Statement
CO1	Simple and advanced analytical tools are learnt to measure the chemical composition and concentration of different types of pollution in air, water and the earth in addition to food and fuels.

## IV Semester

**Title of the Course with Code:** CHO HCT – 4.1- Advanced Organic Chemistry

**After completion of this course student should be able to**

CO	Statement
CO1	Get expertise with advanced topics in Organic Chemistry which will be helpful to the student to enter Research and development sections of any institutions and industries along with the teaching profession.

**Title of the Course with Code:** CHI HCT: 4.2 Advanced Inorganic Chemistry

**After completion of this course student should be able to**

CO	Statement
CO1	Recognize the contribution of chemistry of metal molecules to the development of chemistry and other related fields, role of metal ions in photosynthesis, enzymes, metallotherapeutic agents, important catalytic processes.

**Title of the Course with Code:** CHS HCT: 4.3 Spectroscopy and Chromatography

**After completion of this course student should be able to**

CO	Statement
CO1	Combining the different spectral information to gain additional analytical skills. Confirmation of molecular structures from the available data.

**Title of the Course with Code:** CSP SCT: 4.4 Polymer Science and Technology

**After completion of this course student should be able to**

CO	Statement
CO1	Capable to understand the preparation procedures, properties and applications of polymers. Will be able to take up confidently job related to polymers or research

## Department of Studies in Industrial Chemistry

### Programme Outcomes (POs):

**At the end of the programme students will be able to:**

1. **PO1:** Trained the students for skills in synthesis and analysis.
2. **PO2:** The graduates are able to pursue their careers in different fields.
3. **PO3:** The seminars and interactions have improved communication skills and confidence.
4. **PO4:** The in-plant training for a month boosts the employment opportunities in various industries.
5. **PO5:** Special coaching classes have resulted in students clearing KSET/NET examinations.
6. **PO6:** Placed in various positions related to environmental and quality control of various industries.

### Course Outcomes (COs):

#### I Semester

**Title of the Course with Code:** Concepts and Models of Inorganic Chemistry ICI HCT: 1.1

**After completion of this course students will be able to**

CO	Statement
CO1	Have firm foundation in fundamentals and application of current chemical and scientific theories in Inorganic chemistry and learn ionic equilibria, electrical properties of ions in solution and concept of acids and bases.

**Title of the Course with Code:** Theoretical Organic Chemistry ICO HCT: 1.2

**After completion of this course students will be able to**

CO	Statement
CO1	Helps in gaining the basic and fundamental aspects of organic chemistry which is essential for advanced studies.

**Title of the Course with Code:** Chemical Thermodynamics and Chemical Kinetics ICP HCT: 1.3

**After completion of this course students will be able to**

CO	Statement
CO1	Thermodynamics as well as kinetics of reactions knowledge will be acquired. Catalysis and electrochemistry helps in acquiring fundamentals for industrial applications.

**Title of the Course with Code:** Analytical Chemistry – I: ICA SCT: 1.4

**After completion of this course students will be able to**

CO	Statement
CO1	Have firm foundation in fundamentals and application of analytical chemistry. The fundamentals helps in the analytical laboratories and quality control.

## **II Semester**

**Title of the Course with Code:** Coordination Chemistry ICI HCT: 2.1

**After completion of this course students will be able to**

CO	Statement
CO1	Will gain in-depth knowledge of d and f block elements, coordination compounds and organometallic compounds which is essential for future career and competitive exams.

**Title of the Course with Code:** Heterocyclic Chemistry, Natural Products Reagents in Organic Synthesis  
ICO HCT: 2.2

**After completion of this course students will be able to**

CO	Statement
CO1	This course offers the students to get familiarize with heterocyclic compounds, natural products and reagents in organic synthesis. Heterocyclic compounds play an important role in pharmaceuticals.

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**Title of the Course with Code:** Electro-, Quantum- and Photochemistry ICP HCT: 2.3

**After completion of this course students will be able to**

CO	Statement
CO1	Helps to understand mechanism of the reactions, concepts of the basic reactions as well as applications. Helps for basic understanding and competitive exams.

**Title of the Course with Code:** Analytical Chemistry-II: ICA-SCT 2.4

**After completion of this course students will be able to**

CO	Statement
CO1	Acquire fundamental and basic knowledge of spectroscopy essential to understand advance spectroscopic techniques. Helps in academic, industrial and research.

### **III Semester**

**Title of the Course with Code:** SPECTROSCOPY – I ICS HCT: 3.1

**After completion of this course students will be able to**

CO	Statement
CO1	Learn the basic principle and applications of spectroscopy for qualitative and quantitative analysis which helps in the structural determination and also purity of compounds

**Title of the Course with Code:** Unit processes, operations and Management ICU HCT: 3.2

**After completion of this course students will be able to**

CO	Statement
CO1	Able to apply principles of evaporation and distillation; differentiate between different unit operation in the industries; apply important unit operations in the chemical Industries; Knowledge of principles of filtration, mixing, drying Etc.; understand various management aspects of industries.

**Title of the Course with Code:** INDUSTRIAL MATERIALS – I : ICI HCT: 3.3

**After completion of this course students will be able to**

CO	Statement
CO1	Understand the manufacturing process of ceramics, refractories, glass, cements, chemical reactions involved in the setting of cement, raw materials and composition of the cement, common chemicals and petroleum products. This helps and motivates to pursue a carrier in chemical industries. Acquires sufficient knowledge of the various process.

**Title of the Course with Code:** GREEN CHEMISTRY, SOIL AND ENERGY SYSTEMS ICG SCT: 3.4

**After completion of this course students will be able to**

CO	Statement
CO1	Will understand the importance of green processes and green energy for safe future. The expertise is of interest in industries and research

**Title of the Course with Code:** ENVIRONMENTAL AND BIOCHEMICAL ANALYSIS ICE SCT: 3.5

**After completion of this course students will be able to**

CO	Statement
CO1	Simple and advanced analytical tools are learnt to measure the chemical composition and concentration of different types of pollution in air, water and the earth in addition to food and fuels.

## IV Semester

**Title of the Course with Code:** INDUSTRIAL CHEMISTRY-II: ICO HCT:4.1

**After completion of this course student should be able to**

CO	Statement
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CO1	Acquire the in depth knowledge about preparation and properties of bioreactors, Assay and fermentation products, sugar industries, pharmaceuticals, insecticides, fungicides, pulp and paper, electro organic synthesis, liquid crystals. After fourth semester, student will be confident of his knowledge and eager to take up his carrier in chemical industries
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**Title of the Course with Code:** INDUSTRIAL MATERIALS-II: ICD HCT:4.2

**After completion of this course student should be able to**

CO	Statement
CO1	The successful completion, provides knowledge and understanding of different types of dyes, drugs, detergents, rubber, leather industries, Fertilizers based on phosphorous, nitrogen and potassium. Student will be confident of his knowledge and eager to take up his carrier in chemical industries.

**Title of the Course with Code:** Spectroscopy and Chromatography : ICS HCT: 4.3

**After completion of this course student should be able to**

CO	Statement
CO1	Combining the different spectral information to gain additional analytical skills. Confirmation of molecular structures from the available data.

**Title of the Course with Code:** Polymer Science and Technology ICP SCT: 4.4

**After completion of this course student should be able to**

CO	Statement
CO1	Capable to understand the preparation procedures, properties and applications of polymers. Will be able to take up confidently job related to polymers or research