B.Sc. Biotechnology: Semester-IV BST403: Chemistry IV	
Teaching Scheme Lectures: 3 hrs/Week Tutorials: 1hrs/Week Credits: 4	**Examination Scheme** Class Test -12Marks Teachers Assessment - 6Marks Attendance – 12 Marks End Semester Exam – 70 marks

Prerequisite: - Basic knowledge of chemistry

Course Objectives:

1. To give over view of Werner's coordination theory and its experimental verification
2. To give complete knowledge of valence bond theory of transition metal complexes
3. Structure and nomenclature of acid chlorides, esters, amides (urea) and acid anhydrides
4. To describe Mechanisms of esterfication and hydrolysis
5. To explain Migration of ions and Kohlrausch law
6. To explain the Ostwald's dilution law its uses and limitations
7. To explain the Applications of conductivity measurements: determination of degree of dissociation

Course Outcomes:

After completing the course, students will be able to:

CO1: Students will have a firm foundation in the fundamentals and application of current chemical and scientific theories including those in Analytical, Inorganic, Organic and Physical Chemistries.

CO2: Students will be able to design and carry out scientific experiments as well as accurately record and analyze the results of such experiments.

CO3: Students will be skilled in problem solving, critical thinking and analytical reasoning as applied to scientific problems.

CO4: Students will be able to clearly communicate the results of scientific work in oral, written and electronic formats to both scientists and the public at large.

CO5: Students will be able to explore new areas of research in both chemistry and allied fields of science and technology.

CO6: Students will appreciate the central role of chemistry in our society and use this as a basis for ethical behavior in issues facing chemists including an understanding of safe handling of chemicals, environmental issues and key issues facing our society in energy, health and medicine.

CO7: Students will be able to explain why chemistry is an integral activity for addressing

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social, economic, and environmental problems.

Detailed Syllabus:

UNIT-1 Werner's coordination theory
Werner's coordination theory and its experimental verification, effective atomic number concept, chelates, nomenclature of coordination compounds, isomerism in coordination compounds, valence bond theory of transition metal complexes
UNIT-2 Structure and nomenclature
Structure and nomenclature of acid chlorides, esters, amides (urea) and acid anhydrides, Relative stability of acyl derivatives, Physical properties, inter-conversion of acid derivatives by nucleophilic acyl substitution, Preparation of carboxylic acid derivatives, chemical Reactions, Mechanisms of esterfication and hydrolysis (acidic and basic)
UNIT-3 Electrolyte dissociation
Migration of ions and Kohlrausch law, Arrehenius theory of electrolyte dissociation and its limitations, weak and strong electrolytes, Ostwald's dilution law its uses and limitations. Debye-Huckel-Onsagar's equation for strong electrolytes (elementary treatment only). Transport number,definition and determination by Hittorf method and moving boundary method. Applications of conductivity measurements: determination of degree of dissociation

Text and Reference Books

1. A Textbook of Physical Chemistry, A. S. Negi, S. C. Anand
2. Physical Chemistry, Gilbert William Castellan
3. Physical chemistry, Walter John Moore
4. Organic Chemistry, Benjamin List, Keiji Maruoka
5. Advanced Organic Chemistry, 4th ed. Part A: Structure and Mechanisms F. Carey and R. Sundberg, Kluwer Academic

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