



CERTIFICATE COURSE-ONLINE (30 Hours)

DEPARTMENT OF POST GRADUATE STUDIES AND RESEARCH IN BIOCHEMISTRY

TITLE: Basic Concepts of Bioanalytics

Objective

The objective of this course is to empower students of biology and chemistry with in-depth understanding of basic concepts that form the foundation of any qualitative or quantitative analytical/bioanalytical study.

Course Outcomes

Upon completion of this course, students will be able to

1. Explain the concepts related to pH, concentration, and units
2. Perform calculations to prepare various solutions used in Bioanalytics
3. Design and perform quantitative experiments.
4. Analyse and present experimental data

The course will have Three Units.

Each Unit has

1. 7/8 lessons
2. One Unit test= 25 MARKS
3. One Assignment = 25 MARKS

There will be Final test of 100 marks at the end of the course.

UNIT I - Basics for Quantitative Bioanalysis

1. Introduction to Bioanalytics
2. Safe Laboratory Practices
3. Density, specific gravity, and percent composition
4. Dilution, dilution factors, Units, and Interconversion
5. Molarity and Normality
6. Acids and bases and Acid- Base Properties of amino acids, pI
7. pH, pKa and Henderson-Hasselbalch equation
8. pH meter and preparation of Biological Buffers

UNIT II - Quantitation

1. Biochemical calculations
2. Solvents and their use in biology
3. Sample preparation
4. Preparation and storage of reagents
5. Titration
6. Spectrophotometric quantitation. Proteins, DNA and RNA
7. Using Extinction coefficient in bioassays (NAD

UNIT III - Analysis, Interpretation and Presentation of Data

1. Preparation of calibration curve and calculation of results
2. DNA- melting temperatures (T_m) and Cot curve
3. Graphs- linear, logarithmic, and exponential
4. LD_{50} , ED_{50} and IC_{50} calculations
5. LOD and LOQ

6. Mean, SD, SEM, CV
7. Presentation of Experimental Data