BHARATHIAR UNIVERSITY, COIMBATORE.

M. Sc BIOTECHNOLOGY DEGREE COURSE (CBCS PATTERN)

Paper IV BIOPHYSICS AND BIOSTATISTICS

(for the candidates admitted from the academic year 2011-12 onwards)

Subject description:

This course presents the basic concepts of Biophysics and biostatistics.

Goals:

To make the student to understand the fundamentals of Biophysics data analysis by Biostatistics.

Objectives

- On Successful completion the subject student should have understand:
- Understand fundamentals of Biophysics and Bio statistical Methods.

Contents:

Unit I:

Proteins: Amino acids – Conformations. Phi and Psi angles. Ramachandran plot. Peptides – peptide bond isomerisation. Disulphide bonds, short range repulsion, electrostatic forces, van der waals interaction. Hydrogen bonds, Determination structure of proteins: NMR, 3D structure by x- ray diffraction.

Unit II

Nucleic acids: Heterocyclic based- Nucleosides. Nucleotides.. Details geometries of Watson- Crick and Hoogsteen base pairs- Thermodynamic description of stacking interactions – classification of A,B and Z type double helices. Biophysics of protein – DNA Interactions.

Unit –III

Basic principles of spectrophotometry. The laws of absorption, principles and instrumentation for UV-visible and IR spectroscopy. Principles, theory and applications of spectrofluorometry, and Flame photometry.

Unit – IV

Biostatistics – Definitions – Scope of Biostatistics, Classification and tabulation of data – Graphical and diagrammatic representation – scale diagrams – Histograms – frequency polygon- Frequency curves. Measures of Central tendency – arithmetic mean, median and mode. Calculation of mean, median, mode in series of individual observation discrete series, continuous open end classes.

Unit – V

Measures of Dispersion – standard deviation and Range. Chi – square test, student t test, regression, correlation, one way and two way ANOVA and 'T' Test, . Factorial design, Application of statistical software for biological research.

References books:

1. Biophyscial chemistry – principles and Techniques- Upadhyay, Upadhyay Nath.
2. Biophysical chemistry – Cantor and Schinmel.
3. Introductory Biostatistics by chap. T.Lee (Wiley – Interscience
4. Statistical methods edited by Stephen W.Looney (Humana publications)
5. Biostatistics: A Methodology for the Health Sciences, Second Edition, by Gerald Van belle (Wiley – Interscience publication)
6. http://www.itl.nist.gov/div898/handbook/prisection3/pri3.htm(online e book)
7. http://www.statease.com/de7_man.html(software tutorial websidte)