Course Code	Course Title	C	H	I	E	T
17U6ZME2	Biophysics, Biostatistics and Bioinformatics	6	5	25	75	100

Objectives

- To learn the basic principles and applications of Biophysics.
- To study methods of collection, analysis and interpretation of biological data.
- To motivate the students to learn the basic concepts and applications of bioinformatics.

Learning Outcome

1. Acquire knowledge on principles and applications of biophysics and bioinformatics.
2. Study about handling of biological data for statistical analysis.

Unit- I

Scope of Biophysics: Colloids - Description, properties and types. Diffusion, osmosis, dialysis. Law of thermodynamics - entropy, enthalpy. Protein Structure – Primary, secondary, Tertiary and quaternary

Unit- II

Biostatistics: definition, Types of data (Primary and secondary data), Methods of collection of Primary and secondary data, Classification of data, Tabulation, Organization of data: Individual, discrete and frequency Series. Diagrammatic and graphical presentation of Data: Histogram, frequency curve, bar diagram, pie diagram and pictogram.

Unit- III Measurement of Central tendency (mean, median, mode for individual, discrete and frequency series), Measures of dispersion (Range, standard deviation), Chi-square test, students t test, Correlation, Mann-whitney-U test, Kruskal-wallis test.

Unit- IV

History and Generation of Computer, Basic components of Computer, Input and Output devices, Central Processing Unit, Memory and its types. Brief account on packages - MS Word, MS Excel and MS PowerPoint. Basic ideas about internet: Website, Email and other uses of Internet.

Unit- V

Bioinformatics: Definitions, History and Applications of Bioinformatics, Biological Databases: features, classification of Biological databases, PUBMED, ENTREZ, EMBL, ENSEMBL, GENBANK, Swiss-Prot, PDB, RasMol, DDBJ, BOLD (Barcode of Life Data systems). Sequence alignment: BLAST, FASTA,

Text Books

1. Subramanian, M.A.2005, Biophysics, Principles and Techniques, M.J.P. Publishers, Chennai.
2. Ramakrishnan, P. 1996, Biostatistics, Saras Publications, Nagercoil.
3. Ardert T. 2002, Information Technology, Pitman Publishers.
4. Banerjee, P. 2014, Introduction to Bioinformatics, S.Chand and Company Pvt Limited, New Delhi.
5. Lesk, A.M. 2007, Introduction to Bioinformatics, Oxford University Press, New Delhi.
6. Hepsyba, S.G.H. and C.R. Hemalatha. 2009, Basic Bioinformatics. MJP Publishers. Chennai.

Reference Books

1. Daniel, M. 1992, Biophysics Biologist, Wiley International, New Delhi.
2. Das, D, and Das, A. 2004, Statistics in Biology and Psychology Acad. Publishers, Kolkata.
3. Das, D. 1996, Biophysical and Biological Chemistry, Academic Publishers, Kolkata.
4. Gurumani, N. 2004, Introduction to Biostatistics, M.J.P. Publishers, Ned Delhi.
5. Sokal, R.J. and Rohlf, S.J. 1981, Introduction to Biostatistics, W.H.Freeman, London.
6. Leon F. and Lean M. 2004, Fundamentals of Computer Science and Communications Engineering, Lean Tech World.
7. Mittal C. 2003, Fundamentals of Information Technology, Pragathi Prakasam, Meerut.
8. Piramal, V. 2006. Biophysics. Dominant publishers and distributors. New Delhi.
9. Zar, J.H. 2011. Biostatistical Analysis. Pearson Education Inc. New Delhi.
10. Murthy, C.S.V. 2004, Bioinformatics, Himalaya Publishing House, New Delhi.