MANGALORE UNIVERSITY

DEPARTMENT OF BIOCHEMISTRY

MSc Biochemistry

SOFTCOREBCS 553: BIOINFORMATICS & BIOSTATISTICS

Total Number of LectureHours:42 **Total Number of Credits:03**

Course objectives:

- To learn the all the basic concepts ofstatistics.
- To have a basic knowledge ofcomputers
- To understand the fundamental and necessary aspects ofbioinformatics.

Course outcome:

- Student will have a knowledge of statistics such as measures of central value, coefficient of variation, sampling, probability, tests of significance and analysis of variance. This would help the student during data analysis especially if he intends to doMPhil/PhD.
- Student will become more computer savvy after knowing the hardware andsoftware.
- Use of bioinformatic tools to substantiate the results especially duringresearch.
- This Course will have a lot of impact on the student to critically analyze the data and draw a conclusion of the experimentalresults.

UnitI **1**

4hrs.

Measures of central value - Mean, mode and median; Statistics of Dispersion; Coefficient of variation; Concepts of moments, skewness and kurtosis; Simple correlation and regression; Concept of sampling and sampling methods. Probabilityandlawofprobability;Probabilitydistributions(binomial,poissonandnormal);Testsofstatisticalsignificance (t –Test, Chi-square test); Analysis ofvariance.

UnitII **1**

4hrs.

Computer fundamentals: Binary, Octal, Hexadecimal number system, compliment number
representation; components of a digital computer, I/O devices, storage devices, MS -Office (MS-Word, MS-excel, MS- power point).

UnitIII **14 hrs.**

Bioinformatics: Introduction; Biological Databases (GenBank, Swiss Prot and PDB). Sequence
Comparison Methods: Needleman Wunch & Smith Waterman algorithms. Database search algorithms: BLAST and FASTA. Multiple Sequence Alignment. Gene Prediction. Protein Structure Prediction. Use of Clustal and

PHYLIP.

REFERENCES:

1. Fundamentals of Computers (Second Edition) by V. Rajarama, PHI (P) Ltd., NewDelhi
2. MS-Office-2000 BPBPublications
3. Elementary Statistical Methods by S.P. Gupta, Sultan Chand &Sons
4. Introduction to computers (Fourth Edition), Peter Norton's Tata McGrawHill
5. Research and Documentation in the Electronic Age by Diana Hacker and Barbara Fister, 2006, Bedford/St. Martin'spublisher.
6. Little, Brown Guide to Research & Documentation by Aaron, 2004, McGrawHill
7. Bioinformatics for Dummies, Jean-Michel Claverie, Cedric Notredame (2003) John Wiley & Sons
8. Bioinformatics Computing, Bryan P. Bergeron (2002) PrenticeHall
9. Introduction to Bioinformatics, Arthur M. Lesk (2002) Oxford UniversityPress
10. Introduction to Bioinformatics, Teresa Attwood, David Parry-Smith (2001) PrenticeHall

Fundamental Concepts of Bioinformatics, Dan E. Krane, Michael L. Raymer, MichaeelL. Raymer, Elaine NicponMarieb (2002) Benjamin/Cummings (2002)Benjamin/Cummings