**BIOSTATISTICS** **CREDIT HOURS 03**

**LEARNING OUTCOMES:**

**Students will able to:**

1. Explain what is meant by statistical observation , inference, biological variance
2. Distinguish between populations and samples.
3. Distinguish between population parameters and sample statistics.
4. Compute a sample mean, sample variance, and sample standard deviation.
5. Compute a population mean, population variance, and population standard deviation.

**COURSE CONTENTS:**

Introduction to Biostatistics and its scope in Molecular biology; Collection of Primary and Secondary data; editing of data; Presentation of data: Tabulation, Classification, Visual Presentation (Diagrams and Graphs); Measures of Central Tendency: Arithmetic Mean by direct and short-cut method, Geometric Mean, Harmonic Mean, Mode, Median, ED50 (LD50  in detail ), Quartile; Measures of Dispersion: Range, Quartile Deviation, Mean Deviation, Standard Deviation by direct and short-cut method, Variance, and their Coefficient; Correlation: Simple Correlation Table, Rank Correlation, Partial and Multiple Correlation; Regression and method of least square; Probability: Concept of Probability, Laws of Probability; Permutation and Combination; Probability distributions: Binomial distribution, Poisson distribution and their fitting to observed data, Normal distribution; Sampling and Basic Design; Hypothesis Testing; Chi-square test, Student’s t-test, Analysis of variance; Multivariate analysis; Knowledge of statistical software; Laboratory Experiments pertaining to the course.

**RECOMMENDED BOOKS:**

1. Fernholz, L.T, Morgenlhaler, S. and Stahel, W. 2000. *Statistics in Genetics and in Environmental Sciences*, Birkhauser Verlag, Switzerland.
2. Quinn, G., 2002. *Experimental Design and Data Analysis for Biologists,* Cambridge University Press, U.S.A.
3. [Gerstman](http://www.amazon.com/B.-Burt-Gerstman/e/B00ETQDTRW/ref=dp_byline_cont_book_1), B.B. 2014. *Basic Biostatistics: Statistics for Public Health Practice*. 2ndEdition. Jones and Bartlett learning publications. 5 wall street Burlington MA01803.

Glover, T. and Mitchell, K., 2015. A*n Introduction to Biostatistics*, Third Edition 3rdEdition . Waveland Press, Inc.Long grove, IL,60047-9580.