

Educational objectives:

1. This course is designed for students to understand different computational biological algorithms, construct data models, use of molecular databases, use of commonly available software for the analysis of biomolecular sequences and structures in viral and cellular genes. They should be able to interpret the results, describe common post-genomic experimental technologies associated with high-throughput data production.

2. **Course Outcomes:**

- a. Empowering the student to apply statistical analysis to research data and to reject or accept the null hypothesis.
- b. Applying sampling techniques and making experimental designs to validate one's data through replication.
- c. Imparting the skill to use statistical software like SPSS, U and Sigma Stat/Sigma Plot for reporting data and writing thesis.

3. **Course Contents:**

- a. Descriptive Biostatistics
- b. Types of numerical data
- c. Data sampling methods
- d. Graphical display of Data
- e. Measurement of central tendency
- f. Measurement of dispersion
- g. Probability and probability distributions
- h. Chi-Square Test
- i. T-Test
- j. Module II: Inferential Biostatistics

- k. Sampling Distributions
- l. Confidence Intervals
- m. Baye's Theorem
- n. Hypothesis Testing
- o. Experimental Design
- p. Introduction to operating systems
- q. Basics of Linux operating system
- r. Words Processing, Spreadsheet and Presentation Skills
- s. Internet for Biologists
- t. Introduction to programming languages
- u. Introduction to perl programming language
- v. Programming skills in perl
- w. Perl applications in bioinformatics
- x. Introduction to databases
- y. COBRA – Common Object Request Broker Architecture
- z. MySQL database management system

Recommended Books:

1. **Introductory Applied Biostatistics** by Ralph B. D'Agostino
2. **Basic and Clinical Biostatistics** by Beth Dawson
3. **High-Yield Biostatistics** by Anthony N. Glaser
4. **Intuitive Biostatistics: A Nonmathematical Guide to Statistical Thinking**
5. **Biostatistics: The Bare Essentials** by Geoffrey R. Norman
6. **Principles of Biostatistics** by Marcello Pagano, Kimberlee Gauvreau
7. **Primer of Biostatistics** by Stanton A. Glantz
8. **Fundamentals of Biostatistics**

9. **Biostatistics: A Foundation for Analysis in the Health Sciences** by Wayne W. Daniel
10. **Epidemiology, Biostatistics and Preventive Medicine** by James F. Jekel
11. **Biostatistical Analysis** by Zar, J.H.
12. **Biostatistics: Statistics in Biomedical Public Health and Environmental** by Sen P.K.