



Course Title: Biostatistics

Course Code: BIOT 213

Credit Units: 03

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
3	0	0	0	3

Course Objectives: The course aims to develop competency and expertise in the application of statistical methods applied to biological data obtained in experimental techniques.

Pre-requisites: General

Student Learning Outcomes:

At the end of the course the learner shall be able to:

- Know data characteristics and form of distribution of Data Structure
- To understand the exact method of data analysis for the problem under investigation
- Understanding for drawing valid inferences and to plan for future investigations

Course Contents/Syllabus- Theory:

	Weightage (%)
Module I	15
<u>Descriptive statistics</u> Measures of Central Tendency (Mean, Median, Mode), Measures of dispersion (Range, Mean Deviation, Standard Deviation, Quartile Deviation), combined mean and variance, covariance, Graphs (Bar Chart, Pie Chart, Box Plot, Histogram, Ogive, scatter plot)	
Module II	

Correlation, Types of Correlation, Simple Correlation Coefficient for ungrouped data, Properties and Interpretation of Correlation Coefficient, Coefficient of determination, Scatter diagram, Standard Error, Probable error of Correlation Coefficient. Spearman Rank correlation, Some examples. Linear regression and multiple regression, Some examples. Method of least square: Fitting of straight line, parabolic and exponential curve.	20
Module III	20
Probability: Random Experiments, Trial and Event, Sample Space, Mutually Exclusive or Disjoint Events, Mutually Exhaustive Events, Equally Probable Events, Complementary Event, Classical definition of Probability, Statistical definition of Probability, Axiomatic definition of Probability, Addition theorem, Multiplication theorem, Conditional Probability, Bayes' Theorem.	
Module IV	20
Sampling(probability and non probability and its types), Binomial and Poisson distribution Normal Distribution, Properties of Normal distribution	
Module V	25
Parameter, Statistic, Null hypothesis, Alternative hypothesis, Critical region, Type1 Error, Type 11 Error, Level of significance, P-value and its applications. Test of Significance for Small samples: One sample t-test, Unpaired t test, Paired t-test Chi-square Test: Test of goodness of fit, Test of Independence of attributes F test for equality of Population variances, Analysis of Variance: One way and two way with examples	

Pedagogy for Course Delivery:

Lectures: 39

Tutorial: 0

Presentation/ Seminar: 4

Class Test: 02
 Total: 45

Lab/ Practical details, if applicable: NA

Tutorial:
 Practical:
 Class test :
 Total:

Assessment/ Examination Scheme:

Theory L/T (%)	Lab/Practical/Studio (%)	Total
100	NA	100

Theory Assessment (L&T):

Components (Drop down)	Class Test 1	Home Assignment	Presentation/ Seminar	Attendance	End Term Examination
Weightage (%)	15	10	-	5	70

Lab/ Practical/ Studio Assessment: NA

Components (Drop down)	Continuous Assessment/Internal Assessment							Total
	Performance	Lab record	viva	Attendance	Lab record	Performance	Viva	
Weightage (%)								

Text & References:

Text and references:

- Biostatistics: A foundation for analysis in the Health Sciences, W.W Daniel. Publisher: John Wiley and Sons.

- Biostatistics, P.N Arora and P.K Malhan. Publisher: Himalaya Publishing House.
- S. C. Gupta and V. K. Kapoor, “*Fundamentals of Mathematical Statistics*”, 8th Edition, Sultan Chand & Sons, Delhi, 2003.
- S. C. Gupta and V. K. Kapoor, “*Applied Statistics*”, 8th Edition, Sultan Chand & Sons, Delhi, 2003.
- Marcello Pagano and Kimberley Gauvreau, “*Principles of Bio-Statistics*”, 1st Edition, Duxbury: Thomson Learning, USA, 2000.
- P.N Arora ,Sumit Arora and S Arora,” Comprehensive Statistical Methods “,2nd Edition , Sultan Chand & Sons.