

B.Tech. Biotechnology: Semester-III	
BBT 302: BIostatISTICS	
Teaching Scheme	Examination Scheme
Lectures: 3 hrs/Week	Class Test -12 Marks
Tutorials: 1 hr/Week	Teachers Assessment – 6 Marks
Credits: 4	Attendance – 12 Marks
	End Semester Exam – 70 marks

Course Objective

The course will provide understanding of the fundamentals of statistics, methodology and theory of statistics and their application for solving the problems in the field of life sciences. The objective of this course is to familiarize Students with Basics of Statistics, Permutations & Combinations, concepts of Probability, Principles of Correlation and Regression and Hypothesis Testing.

Course Learning Outcomes

After completing the course, the student shall be able to:

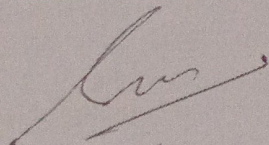
- CO1: Classify various types of data and apply basic statistical concepts such as measures of central
- CO2: Tendencies, measures of dispersion and sampling.
- CO3: use concepts of probability, probability laws, probability distributions and apply them in solving
- CO4: biological problems and statistical analysis.
- CO5: perform statistical hypothesis testing using tools such as t-test, ANOVA, Tukey test and Chisquare test

Unit 1: Basics of Statistics

Data types, classification and summarization of data, graphs and charts, Mean Median, Mode, Standard deviation, dispersion moments and moment generating function, skewness, kurtosis.
Permutations & Combinations: Fundamental principle of counting. Factorial, Permutations and combinations, derivation of formulae and their connections, simple applications.

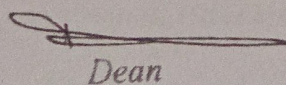
Unit 2: Probability

Algebra of probabilities, Random experiments: outcomes, sample spaces (set representation). Events: occurrence of events, 'not', 'and' and 'or' events, exhaustive events, mutually exclusive events Axiomatic (set theoretic) probability, connections with the theories of earlier classes.



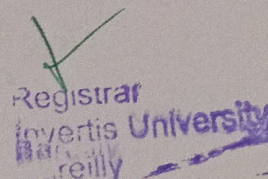
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Probability of an event, probability of 'not', 'and' & 'or' events. Multiplication theorem on probability. Conditional probability, independent events, total probability, Bayes theorem. Binomial distribution, Poisson distribution, Normal distribution and Gaussian distribution.

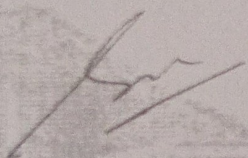
Unit 3: Correlation and Regression

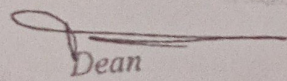
Positive and negative correlation, Pearson and rank correlation coefficients, Non Parametric tests, curve fitting of various curves by method of least square, Linear, non-linear and multiple regression.


Testing: Hypothesis testing, Chi square test and F-tests, Variant, One way and two way analysis of variants, ANOVA, Principles of experimental design and analysis.

Suggested Readings

- N.T.J. Baily; Statistical Methods in Biology; English University Press
- R. Rangaswami; A text Book of Agricultural Statistics, New Age Int. Pub.
- Zar J; Biostatistics; Prentice Hall London
- P.S.S. Sunder Rao; An Introduction to Biostatistics; Prentice Hall
- George W. and William G; Statistical Methods, IBH Publication
- B Ipsen Jetal; Introduction to Biostatistics, Harper & Row Publication
- KR Sundaram, SN Dwivedi, V Sreenivas. Medical Biostatistics. Principle and Methods. BI Publisher. 12 Daryaganj. Delhi


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