

# **KANYA MAHA VIDYALAYA, JALANDHAR (AUTONOMOUS)**

## **SCHEME AND CURRICULUM OF EXAMINATION OF TWO YEAR DEGREE PROGRAMME**

**(Under Credit Based Continuous Evaluation Grading System) (CBCEGS)**

**Master of Science (Zoology)**

**Session: 2023-24**

<b>Semester-II</b>										
<b>Course Code</b>	<b>Course Title</b>	<b>Course Type</b>	<b>Hours Per week</b>	<b>L-T-P</b>	<b>Total Credits</b>	<b>Marks</b>				<b>Examination time (in Hours)</b>
						<b>Total</b>	<b>Th.</b>	<b>P</b>	<b>CA</b>	
MZOL-2334	Biostatistics	C	4	4-0-0	4	100	80	-	20	3

C-Compulsory

Master of Science (Zoology)

Semester-II

Session: 2023-24

Course Title: Biostatistics

Course Code: MZOL-2334

Course Outcomes

After the Successful Completion of the subject students will be able to

CO 1: Know how to collect, analyze and interpret data and use this data to find out different measures of central tendency, dispersion, skewness, kurtosis and moments. They able to define event, outcome, trial, simple event, sample space and calculate the probability of events for more complex outcomes related to conditional, additive and multiplicative law of probability.

CO 2: Able to use and stimulate random variable, distribution function, probability mass function and probability density function using calculus to answer the quantitative questions about the outcome of probabilistic systems. And also understand the concept of mathematical expectation and use it to find out the mean, variance, standard deviation, kurtosis etc. of different probability distributions like Binomial, Poisson and Normal etc.

CO 3: Use Correlation to identify the strength and direction of a linear relationship between two variables and using Regression to predict how much a dependent variable changes based on adjustments to an independent variable and also apply Karl Pearson Correlation coefficient and Spearman's Rank Correlation and Least Square technique for Regression lines.

CO 4: Understand how to develop Null and Alternative Hypothesis and examine the process of Hypothesis testing with reference to one or two tailed test at a given level of significance. Also manage to solve problems using t, Z and Chi-Square test and will be able to describe the use of ANOVA for one way and two way classified data with one observation per cell.

Master of Science (Zoology)  
Semester-II  
Session: 2023-24  
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Examination Time: 3 Hrs

Max. Marks: 100

L T P  
4 0 0

Theory: 80  
CA: 20

Instructions for the Paper Setter:

Eight questions of equal marks (16 marks each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

The students can use only Non Programmable & Non Storage Type Calculator and statistical tables.

UNIT-I

Statistical Method: Collection of data. Frequency distribution and its graphical representation. Measures of central tendency, dispersion, moments, skewness and kurtosis.

Probability: Random experiments, sample space, events. Mathematical definition of probability of an event. Use of permutations and combinations in calculations of probability, Conditional probability, Additive and multiplication law of probability

UNIT-II

Random variables and its pmf, pdf, cdf, mathematical expectation and variances, Distribution of binomial, Poisson and normal variables and (without derivation)

UNIT-III

Correlation and Regression: Relationship between variables, covariance, Karl-Pearson's correlation coefficient, Spearman's rank correlation coefficient, interpretation of correlation coefficients, Least square technique for regression lines (without proof), regression coefficients, relationship between correlation analysis and regression analysis.

UNIT-IV

Hypothesis Testing: Sample statistics and parameters, population null hypothesis, level of significance. Definitions of Chi-square test, Application of X<sup>2</sup>-test as a goodness of fit and association of attributes, t-test as a test of single and difference of means and F-test as a test of equality of population variances in testing of hypothesis.

Analysis of Variance: Analysis of variance for one-way classified data.

Text Book:

P.N. Arora, P.K. Malhan, Biostatistics, Himalaya Publishing House, Mumbai, Reprint 2013.

Reference Books

1. S.C. Gupta, V.K. Kapoor, Fundamental of Mathematical Statistics, Sultan Chand & Sons, Twelfth Edition, 2020
2. E. Batschelet, Introduction to Mathematics for Life Scientists, Springer Publisher, Third Edition, 1979