CENTRE FOR DISTANCE AND ONLINE EDUCATION

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI – 620 024.

ALLIED - MATHEMATICAL STATISTICS

(Applicable to the candidates admitted form the academic year 2026-2027 onwards)

Year: I		**Semester:** I
	ALLIED COURSE I **MATHEMATICAL STATISTICS – I**	

Objectives:

1. To learn the basic concepts of statistics
2. To learn the basic ideas of statistical data

UNITI

Statisticaldata – Primary data and Secondary data(definitions only), Formation of frequency distribution, various measures of central tendency – mean ,median, mode, geometric mean harmonic mean – simple problems – properties of above measures.

UNITII

Measures of dispersion – Range quartile deviation mean deviation, standard deviation – their coefficients- merits and demerits (simple problems) – Skewness and kutosis Karlpearson's coefficients- simple problems.

UNITIII

Probability- Definition, axiomatic approach to probability - Additive and Multiplicative laws of Probability (two variables only) and Conditional probability – simple problems- Concept of random variables – discrete and continuous random variables - Distribution function, pmf and pdf and their properties- simple problems.

UNITIV

Mathematical Expectation – addition and multiplication theorems (two variables only) – Moment generating and characteristics functions, their properties (simple problems).

UNITV

Binomial and Poisson distributions – moments, moment generating function cumulant generating function (Simple problems)- fitting of binomial and poisson distribution.

UNIT – VI (Advanced topics only for discussion)

Current Contours: An introduction to SPSS software

TEXTBOOK(S)

1. Gupta S.C. and Kapoor V.K.,Fundamentals of Mathematical Statistics, Sultan Chand & Sons.
2. S.P. Gupta , Statistical Methods (Revised edition 2001)

REFERENCE(S)

1. Gupta S.C. and Kapoor V.K., Fundamentals of Applied Statistics, Sultan Chand & Sons.
2. R.S.N. Pillai and Bagavathi, Practical statistics, Second edition (2013)

Course Outcomes : After completing this course, the students will be able to

1. Understand random variables and probability distributions.
2. Know the difference between continuous and random variables.
3. Acquire the knowledge by using Binomial and Poisson distribution.

Year : I		**Semester :** II
	ALLIED PRACTICAL **MATHEMATICAL STATISTICS** **PRACTICAL**	

25 marks for records and 75 marks for Practical Examination
Passing minimum for Record – 10 marks (out of 25 marks)
Practical Examination – 30 marks (out of 75 marks)

Objectives :

1. To train the students in solving statistical problems

UNITI

Moments of central tendency- A.M, median, G.M and H.M- Measures of Dispersion- quartile deviation, standard deviation and co-efficient of variation measures of skewness.

UNITII

Bivariate discrete probability distribution- marginal distribution and conditional distribution – Calculation of mean, variance, covariance, correlation coefficient, expectation .

UNITIII

Fitting of binomial, poisson and normal distributions (area method only).

UNITIV

Calculation of Karl pearson's coefficient of correlation, Spearman's rank correlation and regression equations.

UNITV

Large sample tests- Test of single mean- Difference between means – single proposion and Difference between proposion. Exact simple test- t' test for single mean, Difference between means, paired t - test - chisquare test for goodness of fit and independence of attributes.

UNIT – VI (Advanced topics only for discussion)

Current Contours: An introduction to Rpackage

TEXTBOOK(S)

1. R.S.N. Pillai and Bagavathi, Practical statistics, Second edition (2013).

REFERENCE(S)

1. Gupta S.C. and Kapoor V.K., Fundamentals of Mathematical Statistics, Sultan Chand & Sons.
2. S.P. Gupta , Statistical Methods (Revised edition 2001).

Course Outcomes : After completing this course, the students will be able to

1. Understand and critically discuss the issues surrounding sampling and significance.
2. Check the given data are correlated or not using Karl Pearson's coefficient of correlation or Spearman's rank correlation.

Year : II		**Semester :** II
	ALLIED COURSE II **MATHEMATICAL STATISTICS – II**	

Objectives:

1. To learn the basic concepts of Discrete continuous distributions
2. To learn the test of significance

UNITI

Normal distribution – derivation of normal from binomial – chief characteristics – M.G.F & C.G.F of normal distributions – Moments of normal distributions – area property – fitting of normal distributions.

UNITII

Continuous distributions – Rectangular, Gamma, Beta,exponential – distributions-samplingdistributions, 't' , 'F' and Chi-square distributions.

UNITIII,

Correlation – Rank correlation, Karl Pearson's correlation co-efficient and itsproperties. Linear regression and its properties.

UNITIV

Test of significance – Definition of null hypothesis, alternative hypothesis, sampling distribution, standard errorand critical region. Type I and Type II errors, one tailed and two tailed tests.Large sample test for single mean, Difference between means.

UNITV

Small sample tests – 't' test for single mean. Difference between means. Paired 't' test, Chi- square test for goodness of fit.

UNIT – VI (Advanced topics only for discussion)

Current Contours: An introduction to Data science.

TEXTBOOK(S)

1. Gupta S.C. and Kapoor V.K., Fundamentals of Mathematical Statistics, Sultan Chand & Sons.

REFERENCE(S)

1. R.S.N. Pillai and Bagavathi, Practical statistics, Second edition (2013).
2. S.P. Gupta, Statistical Methods (Revised edition 2001).

Course Outcome : After completing this course, the students will be able to

1. Understand the meaning of correlation, regression and its properties.
2. Apply the concepts of t, F, z distributions and its applications.
3. Apply the concepts of sampling techniques and procedure of testing of hypothesis for large samples.