

SARDAR PATEL UNIVERSITY
S.Y. B.SC. FOURTH SEMESTER
(EFFECTIVE FROM JUNE, 2011)
STATISTICS
COURSE CODE: US04CSTA01
(Statistical Techniques)

Course credit: 3

No. of lectures per week: 3

All units carry equal Weightage

Weightage: Internal – 30%, External – 70%

1. To use forecasting and data analysis techniques in case of Univariate and Bivariate data sets.
2. To study applications of statistics in the field of Industry, Business, and Economics.

Unit-I Curve fitting

- Method of least squares

Fitting of (i) $y = a + bx$ (ii) $y = a + bx + cx^2$ (iii) $y = ab^x$ (iv) $y = aX^b$

Unit-II Correlation

- Objectives, Definition

Methods of studying correlation

- Scatter diagram method
- Karl- Pearson's correlation coefficients and its properties (with proof)
- Spearman's Rank Correlation coefficient and its properties (with proof)
- Examples

Unit-III Regression

- Meaning and importance, Derivation of both the regression lines and properties of regression coefficients (with proof)
- Examples

Unit-IV Time series forecasting

- Components, additive and multiplicative models

Calculation of trend using

- (1) Free hand curve (2) Semi averages method (3) Moving average (4) least square method

Calculation of seasonal indices using

(1) Simple Average (2) Ratio to Trend (3) Ratio to Moving Average, method

Unit-V Assignment Problem

- Introduction
- Mathematical formulation of Assignment problem
- Hungarian Assignment method
- Unbalanced Assignment Problem
- Maximal Assignment Problem

Unit-VI Transportation Problem

- Introduction
- Mathematical formulation of Transportation problem

Methods of finding i.b.f. solution

- North West Corner Method (N-W Corner Method)
- Row Minima Method
- Column Minima method
- Matrix Minima Method (Least Cost Entry Method)
- Vogel's Approximation method (VAM)

References:

- (i) Gupta S.C. and Kapoor V.K. Fundamentals of applied statistics
- (ii) Ken Black, Business Statistics (4th edition) Willey student edition
- (iii) Gupta S.C, Fundamentals of statistics by S.C. Gupta
- (iv) Operations Research by S.D.Sharma

SARDAR PATEL UNIVERSITY
S.Y.B.SC. FOURTH SEMESTER
(EFFECTIVE FROM JUNE 2011)
STATISTICS
COURSE CODE: US04CSTA02
(Probability distributions)

Course credit: 3

No. of lectures per week: 3

All units carry equal Weightage

Weightage: Internal – 30%, External – 70%

Objectives:

1. To fit various discrete and continuous probability distributions and to study various real life situations.
2. To identify the appropriate probability model that can be used.

Unit-I Discrete probability distributions-I

- Bernoulli distribution
- Binomial distribution
- Poisson distribution
- Discrete uniform distribution
- Mean variance, m.g.f, p.g.f and c.g.f. and its applications

Unit-II Discrete probability distributions-II

- Hypergeometric distribution
- Geometric distribution
- Negative binomial distribution
- Mean variance, m.g.f, p.g.f and c.g.f. and its applications

Unit-III Continuous probability distribution-I

- Continuous uniform distribution
- Normal distribution
- Mean variance, m.g.f, p.g.f and c.g.f. and its applications

Unit-IV Continuous probability distribution-II

- Exponential distribution
- Gamma distribution
- Beta distribution of first and second kind
- Mean variance, m.g.f, p.g.f and c.g.f. and its applications

Unit-V Properties and Applications of Standard Distributions:

- Normal distribution as a limiting case of Binomial and Poisson distribution (without proof).
- Additive properties of Bernoulli, Binomial, Poisson and Normal distribution and its applications.

Unit-VI Sampling from Normal distribution.

- Sampling distributions of Mean and variance
- Chi-square, t, and F distributions and examples

References:

- (i) Gupta S.C. and Kapoor V.K. Fundamentals of Mathematical Statistics
- (ii) Richard Johnson and Gouri Bhattacharya, Statistics-Principles and methods

SARDAR PATEL UNIVERSITY
S.Y.B.SC FOURTH SEMESTER
(EFFECTIVE FROM JUNE, 2011)
STATISTICS
COURSE CODE:US04CSTA03
(PRACTICALS)

Course credit: 3

No. of lectures per week: 6

Weightage: Internal – 30%, External – 70%

Section-I (Manual)

1. Fitting of Discrete distributions:

- Binomial, Poisson, Geometric, Negative Binomial

2. Fitting of Continuous distributions:

- Normal and Exponential distribution

3. Time-series Forecasting:

Calculation of Trend values using

- Free hand curve
- Semi average method
- Moving average
- Least square method

Calculation of seasonal indices using

- Simple Average
- Ratio to Trend
- Ratio to Moving Average, method

4. Assignment Problem

- Hungarian Assignment method
- Unbalanced Assignment Problem
- Maximal Assignment Problem

5. Transportation Problem

Methods of finding i.b.f. solution

- North West Corner Method (N-W Corner Method)
- Row Minima Method
- Column Minima method

- Matrix Minima Method (Least Cost Entry Method)
- Vogel's Approximation method (VAM)

Section-II (Pascal Programming)

Write a Pascal program to

- Calculate correlation coefficient and regression lines
- Fit (i) $y = a + bx$ (ii) $y = a + bx + cx^2$ (iii) $y = ab^x$ (iv) $y = aX^b$

SARDAR PATEL UNIVERSITY
S.Y. B.SC. FOURTH SEMESTER
(EFFECTIVE FROM JUNE, 2011)
STATISTICS
COURSE CODE: US04ESTA01
(OPERATIONS RESEARCH)

Course credit: 2

No. of lectures per week: 2

All units carry equal Weightage

Weightage: Internal – 30%, External – 70%

Unit-I Transportation Problem-I

- Introduction
- Mathematical formulation of Transportation problem

Methods of finding i.b.f. solution

- North West Corner Method (N-W Corner Method)
- Row Minima Method

Unit-II Transportation Problem-II

- Column Minima method
- Matrix Minima Method (Least Cost Entry Method)
- Vogel's Approximation method (VAM)

Unit-III Elements of Game theory

Unit-IV Network analysis

References:

- (i) Operations Research by S.D.Sharma
- (ii) Operations Research by J.K.Sharma

SARDAR PATEL UNIVERSITY
S.Y. B.SC. FOURTH SEMESTER
(EFFECTIVE FROM JUNE, 2011)
COURSE CODE: US04FSTA01
STATISTICS
(FOUNDATION COURSE)

Course credit: 2

No. of lectures per week: 2

All units carry equal Weightage

Weightage: Internal – 30%, External – 70%

Unit-I Probability distributions

- Binomial , Poisson and Normal distribution
- Applications

Unit-II Analysis of Categorical data

- Consistency of data
- Independence and association of data
- Various measures of association for two-way and three-way classified data(Yule's coefficient of association and Coefficient of colligation)

Unit-III Test of Significance-I

Test of Independence

Large sample test

- Test for population proportion
- Test for difference between two population proportions
- Test for population mean
- Test for difference between two population means

Unit-IV Test of Significance-I

Small sample test

- Test for population mean
- Test for difference between two population means(Unpaired t-test)
- Test for difference between two population means(Paired t-test)
- Test for population correlation coefficient

References:

(v) Gupta S.C. and Kapoor V.K. Fundamentals of applied statistics

(vi) Gupta S.C, Fundamentals of statistics by S.C. Gupta