

SARDAR PATEL UNIVERSITY
B.SC. (STATISTICS) SEM. 4
(EFFECTIVE FROM JUNE, 2019)
US04CSTA21 : (STATISTICAL TECHNIQUES)

Course credit: 4

No. of lectures per week: 4

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

- **Principle of least squares**
- **Fitting of (i) $Y = a + bX$ (ii) $Y = a + bX + cX^2$ (iii) $Y = ab^X$ (iv) $Y = aX^b$**
- **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 - II Multiple, Partial correlation (for 3 variables only) and Regression

- **Multiple correlation**
- **Partial correlation**
- **Examples**
- **Regression**
 - **Meaning and importance, Derivation of both the regression lines and properties of regression coefficients (with proof)**
 - **Examples**
 - **Multiple linear regression with two independent variables**

Unit - III Time series Analysis

- **Components, Additive and Multiplicative models**
- **Calculation of trend using**
 - **Free hand curve**
 - **Semi averages method**
 - **Moving average**
 - **Least squares method**
- **Calculation of seasonal indices using**
 - **Simple Average**
 - **Ratio to Trend**
 - **Ratio to Moving Average, method**

Unit - IV Statistical Quality Control (SQC)

- Introduction
- Types of Control charts
 - For Variables: \bar{X} and R Charts
 - For Attributes: p , np and C charts

References:

1. Gupta S.C. and Kapoor V.K. Fundamentals of applied statistics
2. Ken Black, Business Statistics (4th edition) Willey student edition
3. Gupta S.C, Fundamentals of statistics by S.C. Gupta

SARDAR PATEL UNIVERSITY
FOURTH SEMESTER
(EFFECTIVE FROM JUNE 2019)
SUBJECT: STATISTICS
COURSE CODE: US04CSTA22
(PROBABILITY DISTRIBUTIONS)

Course credit: 4

No. of lectures per week: 4

All units carry equal Weightage

Weightage: Internal – 30%, External – 70%

Objectives:

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

Unit - I Discrete probability distributions

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

Unit - II Continuous probability distributions

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

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

References:

1. Gupta S.C. and Kapoor V.K. Fundamentals of Mathematical Statistics
2. Richard Johnson and Gouri Bhattacharya, Statistics-Principles and methods

**SARDAR PATEL UNIVERSITY
FOURTH SEMESTER
(EFFECTIVE FROM JUNE, 2019)
SUBJECT: STATISTICS
COURSE CODE:US04CSTA23
(STATISTICS PRACTICAL – III)**

Course credit: 2

No. of lectures per week: 4

Pascal Programming :

- Write a Pascal program to
 - Calculate correlation coefficient and regression lines
 - Fitting of curves:
 - $Y = a + bX$
 - $Y = a + bX + cX^2$
 - $Y = ab^X$
 - $Y = aX^b$
 - Multiple and Partial correlation(for 3 variables only)
 - Multiple linear regression with two independent variables

SARDAR PATEL UNIVERSITY
FOURTH SEMESTER
(EFFECTIVE FROM JUNE, 2019)
SUBJECT: STATISTICS
(STATISTICS PRACTICAL – IV)

Course credit: 2

No. of lectures per week: 4

Manual :

- **Fitting of Discrete distributions**
 - **Binomial, Poisson, Geometric, Negative Binomial**
- **Fitting of Continuous distributions**
 - **Normal and Exponential distribution**
- **Time-series Analysis**
 - **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**
- **Statistical Quality Control**
 - **Control charts for**
 - **Variables: \bar{X} and R charts**
 - **Attributes: p , np and C charts**