



ST. XAVIER'S COLLEGE – MUMBAI
(Est. 1869)

(An Autonomous College affiliated with the University of Mumbai)

**Syllabus for Four-Year Undergraduate
Programme as per National Education Policy
(NEP-2020)**

**Programme:
BA in STATISTICS**

The academic year 2023–2024



APPROVED SYLLABUS

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PRINCIPAL
ST. XAVIER'S COLLEGE
(AUTONOMOUS)
MUMBAI - 400 001.

Syllabus

First Semester Courses in Statistics

2023-2024

Contents:

- Syllabus for Minor Courses:
 - UASTA4501MN1 : Fundamentals of Statistics (A)
 - UASTA4501MN1PR : Fundamentals of Statistics (A)(Practical)

- Evaluation and Assessment guidelines



APPROVED SYLLABUS

| First Year BA in Statistics | | |
|---|--|--|
| Course Title: Fundamentals of Statistics (A) | | Course Code:UASTA4501MN1 |
| Credits: Theory (3) = 45 hr | | |
| No. | Course Objectives This course aims to | |
| 1 | introduce various types of data. | |
| 2 | introduce techniques of organization of data. | |
| 3 | emphasize the need for summary measures for data analysis. | |
| 4 | orient students to simple techniques of data analysis. | |
| CO | Course Outcomes On completing the course, the learner will be able to | Bloom's Taxonomy Level (BT level) |
| 1 | i) identify and define different types of data and measurement scales. ii) define various terms used in obtaining summary statistics, correlation and regression. | Knowledge |
| 2 | explain the procedure/concept involved in summary statistics, correlation and regression. | Understanding |
| 3 | solve numericals based on the above topics. | Analysis |



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Unit 1 : TYPES OF DATA & MEASURES OF CENTRAL TENDENCY.

(15 L)

Qualitative and Quantitative data; Geographical, Time series data; Discrete and Continuous data, Panel and Cross section data.

Different types of measurement scales: Nominal, Ordinal, Interval, and Ratio.

Illustrations of Likert scale.

Concepts of statistical population and sample.

Primary & Secondary data.

Secondary data – its major sources including some government publications.

Tabulation and Classification of data. Requisites of a good table.

Univariate frequency distribution of discrete and continuous variables. Cumulative frequency distribution. (Raw data, ungrouped frequency distribution, grouped frequency distribution.)

Bivariate frequency distribution, Marginal and Conditional frequency distributions.

Arithmetic mean (A.M.) and its properties (simple and weighted), Combined mean. Geometric mean (G.M.) and Harmonic mean (H.M.).

Quantiles (Median, Quartiles, Deciles, Percentiles), Mode (Grouping Method not expected).

Empirical relationship between A.M., median and mode. Merits, Demerits and Uses of A.M., Median, Mode, G.M. and H.M.

Requisites of a good average.

Choice of the scale of measurement for each measure of central tendency.

Unit 2 : MEASURES OF DISPERSION.

(15 L)

Absolute measure: Range, Interquartile range, Quartile deviation, Mean Absolute deviation, Standard deviation (Variance) and their relative measures. Combined variance. Raw and Central moments up to the fourth order and the relationship between them (with proof). Measures of Skewness and Kurtosis.



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Unit 3 : MEASURES OF ASSOCIATION, CORRELATION & REGRESSION.

(15 L)

Categorical data analysis for Association in a table using Yule’s coefficient of Association.
 Scatter diagram. Product moment correlation coefficient and its properties.
 Rank correlation Spearman’s measure. Concept of Spurious correlation & causation.
 Concept of Simple linear regression. Principle of least square.
 Fitting of a straight line by the method of least square.
 Relation between regression coefficient and correlation coefficient. Coefficient of determination.
 Fitting of curves reducible to linear form by transformation. Fitting of the quadratic curve using least squares.

List of Recommended Reference Books:

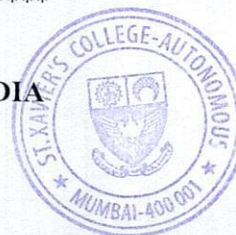
1. Goon A.M., Gupta M.K., Dasgupta B. Fundamentals of Statistics, Volume I, The World Press Private Limited, Calcutta. Fifth edition.
2. Shah R.J.: Descriptive Statistics, Seth Publications. Eighth edition.
3. Spiegel, M.R.: Theory and Problems of Statistics, Schaum’s Publishing Series. Tata McGraw-Hill. First edition.
4. Welling, Khandeparkar, Pawar, Naralkar: Descriptive Statistics: Manan Prakashan
5. S.P. Gupta: Statistical Methods, Sultan Chand & Sons. First edition.
6. Richard. I. Levin, David. S. Rubin: Statistics for Management. Fifth edition
7. <https://corporatefinanceinstitute.com/resources/data-science/descriptive-statistics/>

Evaluation (Theory, UASTA4501MN1): Total marks per course - 100.

- I. Formative Assessment for Learning
 (continuous internal assessment - CIA to improve learning).
 CIA: 40 marks
 CIA 1: Written test: 20 marks
 CIA 2: Written test/Assignment: 20 marks
- II. Summative Assessment of Learning
 (focus on outcomes, quantitative data for outcomes of instruction).
 End Semester Examination : 60 marks
 One question from each unit for 20 marks, with internal choice.
 Total marks per question with choice : 25 to 27.

Distribution of Bloom’s Taxonomy levels for the course assessment:

| Learning Levels | Knowledge | Understanding | Analysis |
|-----------------|-----------|---------------|----------|
| % Weightage | 10-20% | 60-80% | 10-20% |



| | | |
|--|---|--|
| First Year BA in Statistics | | |
| Course Title: Fundamentals of Statistics (A)(Practical) | | |
| Course Code: UASTA4501MN1PR | | |
| Credits: Practical (1) = 30 hr | | |
| No. | Course Objectives | |
| | This course aims to | |
| 1 | classify and tabulate data. | |
| 2 | obtain summary statistics | |
| 3 | measure association, correlation & obtain regression equations. | |
| CO | Course Outcomes | Bloom's Taxonomy Level (BT level) |
| | On completing the course, the learner will be able to | |
| 1 | solve numerical problems based on summary statistics, correlation and regression. | Analysis |

List of Practicals:

1. Classification & Tabulation of data (Quantitative and Categorical)
2. Measures of Central tendency.
3. Measures of Dispersion.
4. Theory of Association, Correlation & Regression.
5. Curve fitting.

Evaluation (Practical, UASTA4501MN1PR)

Total marks practical course - 50

CIA (Written test /Project): 15 marks,

Journal: 5 marks,

End Semester Examination: 30 marks.

Distribution of Bloom's Taxonomy levels for the practical assessment:

| Learning Levels | Analysis |
|-----------------|----------|
| Percentage | 100% |

