



St. Xavier's College – Autonomous Mumbai

F.Y.B.A

Syllabus For 1st Semester Course in Statistics (June 2020 onwards)

Contents:

Theory Syllabus for Courses:

ASTA0101 – Descriptive Statistics (A).

Practical Course Syllabus for: ASTA01 PR

Academic/field/industrial visits and seminars may be organized by the Department, at other venues, as part of the curriculum.

F.Y.B.A
(STATISTICS)

SEMESTER 1

COURSE : ASTA0101

DESCRIPTIVE STATISTICS (A)

(45 LECTURES)

Learning Objectives:

1. **To introduce the technique of data collection and its presentation.**
2. **To emphasize the need for numerical summary measures for data analysis.**

Unit – 1

Data: Types , Collection & Management, Presentation & Visualization.

(15 L)

Types of data from a population :

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

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

Illustrations of Likert scale.

Collection of Data :

Concepts of statistical population and sample.

Primary data- designing a questionnaire/schedule, distinction between them.

Concept of validation of questionnaire.

Problems faced when collecting data through the questionnaire.

Secondary data– its major sources including some government publications.

Elementary Categorical Data Analysis

Preparation of tables with two or three factors (variable /attributes) of classification.

Requisites of a good table. Independence and Association for 2 attributes in a 2 x 2 table using Yule's coefficient of colligation and coefficient of association. Relationship between the two coefficients.

Univariate: Frequency distribution of discrete and continuous variables. Cumulative frequency distribution.

Graphical representation of frequency distribution by Histogram, Frequency polygon, Frequency curve and Ogives.

Data Presentation and Visualization using Bar diagrams and Pie chart.

Exploratory data analysis: Stem and Leaf diagram, Dot plot.

Bivariate : Frequency distribution, Marginal and Conditional frequency distributions.

Unit 2

Measures of Central Tendency or Location.

(15 L)

Arithmetic mean and its properties (simple and weighted), Combined mean. Geometric mean, trimmed mean Quantiles (Median, Quartiles, Deciles, Percentiles.) Mode. (Grouping Method not expected). Empirical relationship between mean, median and mode.

Merits, Demerits and Uses of Mean, Median, Mode, G.M.

Requisites of a good average.

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

Unit 3 : Measures of Dispersion, Skewness & Kurtosis

(15 L)

Range, Interquartile Range, Quartile Deviation, Mean Absolute Deviation, Standard Deviation (Variance) and their relative measures. Combined variance. Raw and Central moments up to fourth order and the relationship between them (without proof). Measures of Skewness and Kurtosis. Box-Whisker Plot.

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. Kothari, C.R.: Research Methodology, Methods and Techniques, Wiley Eastern Limited. First Edition.
3. Shah R.J.:Descriptive Statistics, Seth Publications. Eighth edition.
4. Spiegel, M.R.: Theory and Problems of Statistics, Schaum's Publishing Series. Tata McGraw-Hill. First edition.
5. Welling, Khandeparkar, Pawar, Naralkar : Descriptive Statistics : Manan Prakashan
6. S.P. Gupta : Statistical Methods, Sultan Chand & Sons. First edition.
7. Richard. I. Levin, David .S. Rubin: Statistics for Management . Fifth edition
8. Prem . S. Mann (2007) . Introductory Statistics (6th edition) John Wiley & Sons.
9. Allan Bluman (2009) Introductory Statistics. A step by step approach (7th edition). McGraw-Hill
10. Malhotra Naresh K: Marketing Research, Pearson Education Limited, Fifth edition.

List of Practicals:

1. Collection of Data from Secondary source (including Internet sites) / Primary source
2. Tabulation of data (Quantitative and Categorical)
3. Classification of data.
4. Graphs and Diagrams
5. Measures of Central Tendency.
6. Measures of Dispersion.
7. Skewness and Kurtosis.



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F.Y.B.A

Syllabus For 2nd Semester Course in Statistics (June 2020 onwards)

Contents:

Theory Syllabus for Courses:

ASTA0201 – Statistical Methods (A).

Practical Course Syllabus for: ASTA02PR

Academic/field/industrial visits and seminars may be organized by the Department, at other venues, as part of the curriculum.

F.Y.B.A
(STATISTICS)

SEMESTER 2

COURSE : ASTA0201

Title: Statistical Methods (A).

Learning Objectives:

To study:

- 1. Concept of probability**
- 2. Probability distribution**

No. of lectures: 45

Unit 1

(15L)

Elementary probability theory.

Random Experiment, Sample Point & Sample Space.

Discrete Sample Space, Definition of Event, Elementary Event, Algebra of Events.

Mutually exclusive events, Exhaustive events. Subjective Probability.

Classical, Empirical and Axiomatic definitions of probability.

Conditional Probability, Independence of n Events. ($n = 2, 3$).

Theorems on Addition & Multiplication of Probabilities,

Bayes' Theorem (All theorems with proofs).

Unit 2

(15L)

Discrete Random variable:

Univariate :

Random variable. Definition, Properties of Probability Mass Function & Cumulative Distribution Function. Expectation and variance of a random variable. Theorems on Expectation and Variance.

Raw & Central Moments and the relationship between them (without proof). Concept of Skewness and Kurtosis..

Bivariate:

Joint Probability Mass Function of two Discrete Random Variables, Marginal and Conditional Probability Distributions, Independence of Two Random Variables.

Theorems on Expectation, Variance.

Covariance, Correlation coefficient between two random variables

Unit 3

(15L)

Standard Discrete Probability Distributions:

Discrete Uniform distribution, Bernoulli distribution, Binomial Distribution, Poisson Distribution, Hypergeometric Distribution. Derivation of mean, & variance, Calculation of Expected frequencies.

Binomial approximation to Poisson and Hypergeometric approximation to Binomial Distribution (statement only)

Degenerate distribution.

List of Practicals

1. Probability
2. Discrete Random Variable
3. Bivariate Probability Distributions
4. Binomial, Poisson and Hypergeometric Distributions
5. Calculation of Expected frequency from a conducted experiment.

List Of Recommended Reference Books

1. Statistical Methods : Welling, Khandeparkar, Pawar, Naralkar Manan Publications. First edition.
2. Statistical Methods : R.J. Shah – Seth Publications. Tenth edition.
3. Basic Statistics : B.L. Agarwal – New Age International Ltd. Fifth edition
4. Theory and Problems of Statistics : Spiegel M.R. – Schaums Publishing Series, Tata McGraw - Hill. First edition
5. Probability and Statistical Inference : Hogg R.V, Tanis E.P. – Macmillan Publishing Co. Inc.
6. Fundamentals of Mathematical Statistics : S. C. Gupta, V.K.Kapoor – Sultan Chand & Sons. Eleventh edition.
7. Statistical Methods : S.P. Gupta – Sultan Chand & Sons. Thirty third edition.
8. Fundamentals of Statistics , Volume II, - Goon A.M., Gupta M.K., Dasgupta B. – The World Press Pvt. Ltd, Calcutta. Fifth edition.
9. Richard. I. Levin, David .S. Rubin: Statistics for Management Fifth edition
10. Prem . S. Mann (2007) . Introductory Statistics (6th edition) John Wiley & Sons.
11. Allan Bluman (2009) Introductory Statistics. A step by step approach (7th edition). McGraw-Hill