



St. Xavier's College – Autonomous Mumbai

Syllabus For 2nd Semester Course in Statistics (June 2015 onwards)

Contents:

Theory Syllabus for Courses:

S.STA.2.01 – Descriptive Statistics (B)

S.STA.2.02 – Statistical methods (B)

Practical Course Syllabus for: S.STA.2. PR

F.Y.B.Sc
(STATISTICS)

SEMESTER 2

COURSE : S.STA.2.01

DESCRIPTIVE STATISTICS (B)

[45 LECTURES]

LEARNING OBJECTIVE : To orient students on techniques of data analysis.

Unit –4 : Absolute and Relative Measures of Dispersion. (15 Lectures)

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 (with proof). Measures of Skewness and Kurtosis
Box-Whisker Plot.

Unit-5 : Analysis of Bivariate Data. (15 Lectures)

Scatter diagram. Product Moment correlation coefficient and its properties. Rank correlation-Spearman's measure. Concept of linear regression. Principle of least squares. Fitting of straight line by method of least squares. Relation between regression coefficients and correlation coefficient. Coefficient of determination. Fitting of curves reducible to linear form by transformation. Fitting of quadratic curve using least squares.

Unit-6 : Index Numbers. (15 Lectures)

Index number as a comparative tool. Stages in the construction of Index Numbers.
Simple and Composite Index Numbers.
Fixed base Index Numbers. Chain Base Index Numbers, Base shifting, Splicing and Deflating. Price and Quantity Index Numbers - Laspeyres', Paasche's , Marshal-Edgeworth's, Dorbisch-Bowley's and Fisher's Index Numbers. Value Index Number. Time reversal test. Factor reversal test, Circular test. Cost of Living Index Number. Concept of Real Income based on the Consumer Price Index Number.
Problems in the construction of Consumer Price Index Number.

List of Practicals:

- 1 Measures of Dispersion.
- 2 Skewness and Kurtosis.
- 3 Correlation Analysis
- 4 Regression Analysis.
- 5 Curve fitting by the Method of Least Squares.

REFERENCES:

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 Puplications. 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. www.actuaries.org.uk
11. www.actuariesindia.org
12. www.soa.org

F.Y.B.Sc
(STATISTICS)

SEMESTER 2

COURSE : S.STA.2.02

STATISTICAL METHODS (B)

[45 LECTURES]

LEARNING OBJECTIVES :

**To study : 1) Continuous probability distributions
2) Testing of hypotheses.**

Unit 1 : Continuous Random variable (15 L)

Concept and properties of Probability Density Function and Cumulative Probability distribution Function. Expectation and variance of a random variable and its properties. Measures of location, dispersion, skewness and kurtosis. Raw and Central Moments. (Simple illustrations.)

Unit 2 : Some Standard Continuous Probability Distributions. (15 L)

Rectangular Distribution, Exponential Distribution and Normal Distribution. Derivation of mean, median and variance for Rectangular and Exponential distribution. Properties of Normal Distribution and Normal Curve (without proof). Normal Approximation to Binomial and Poisson Distributions (without proof). and using graph / probability histogram

Unit 3 : Sampling Distribution. (15 L)

Concept of Parameter, Statistic, Estimator and bias. Sampling distribution of estimator. Standard error and M.S.E. of an estimator. Central Limit Theorem (Statement only). Sampling distribution of sample mean and sample proportion for large samples. Point and interval estimation of single mean and single proportion, for large sample only. Statistical tests - Concept of Hypotheses. (Null and Alternative Hypotheses.). Types of Errors, Critical Region, Level of Significance, p-value, Large Sample Tests using Central Limit Theorem, if necessary.
- For testing specified value of population mean
- For testing specified value in difference of two population means
- For testing specified value of population proportion
- For testing specified value in difference of two population proportions.

Statistics in Psychology and Education

Scaling Procedures:- 1) Scaling individual Test items in terms of Difficulty.

2) scaling of scores on a test

a) Z or σ score b) Standard scores c) Normalized scores d) T- scores e) Percentile scores.

Scaling of Rankings in terms of Normal Probability Curve.
Scaling of Ratings in terms of Normal Probability Curve.

TOPICS FOR PRACTICALS.

1. Continuous Random Variables.
2. Uniform, Exponential Distributions.
3. Normal Distribution
4. Testing of Hypotheses
5. Estimation
6. Large Sample Tests.

REFERENCES:

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
12. www.actuaries.org.uk
13. www.actuariesindia.org
14. www.soa.org
